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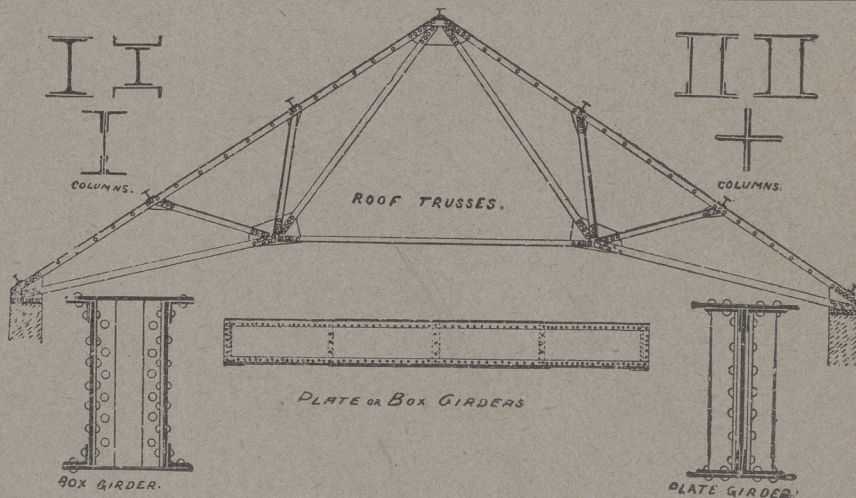
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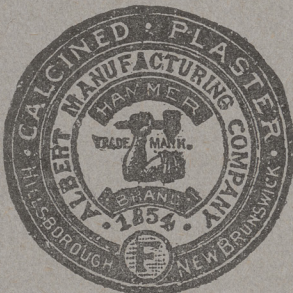
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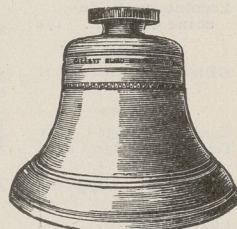
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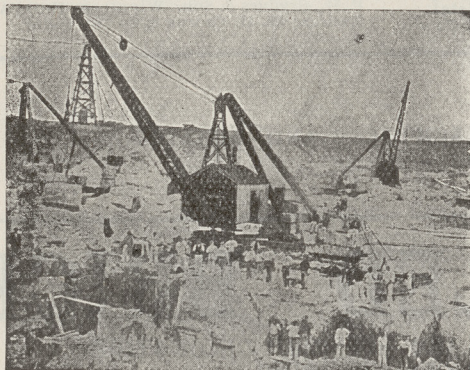
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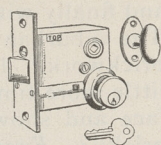
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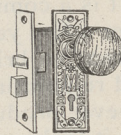
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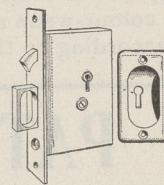
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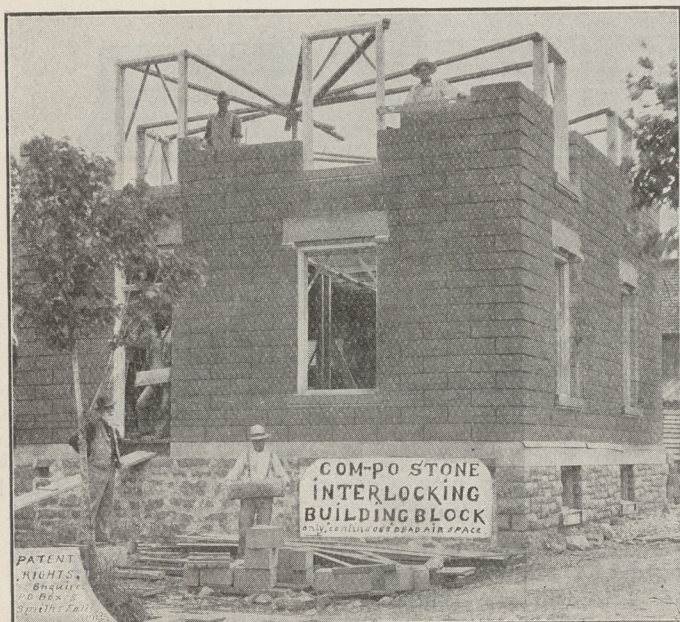
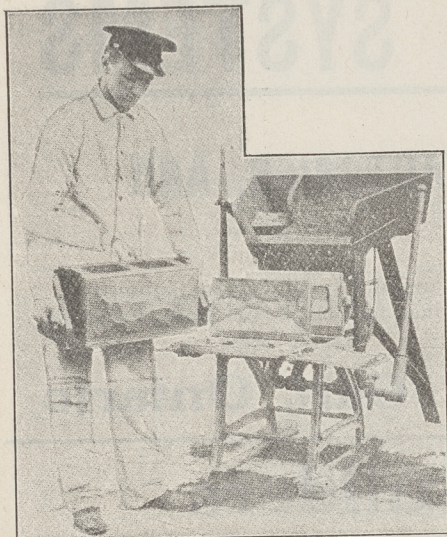
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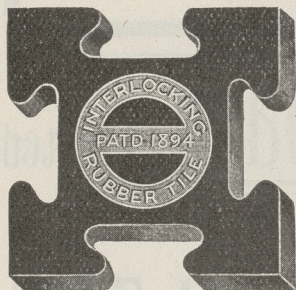
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The second edition of Dwight L. Stoddard's little book, "The Steel Square Pocket Book," has been received recently. This presents many advantages over the first edition, as the matter has been rearranged and much of it rewritten, and some forty new illustrations added.

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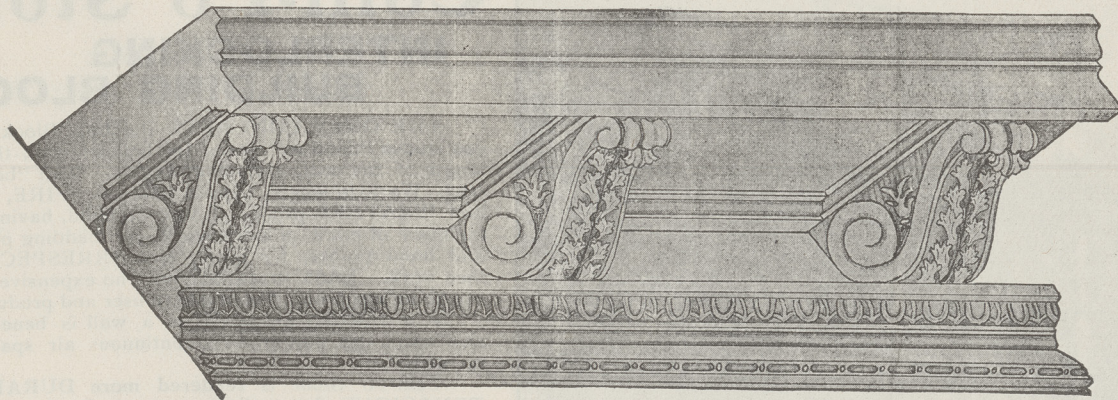
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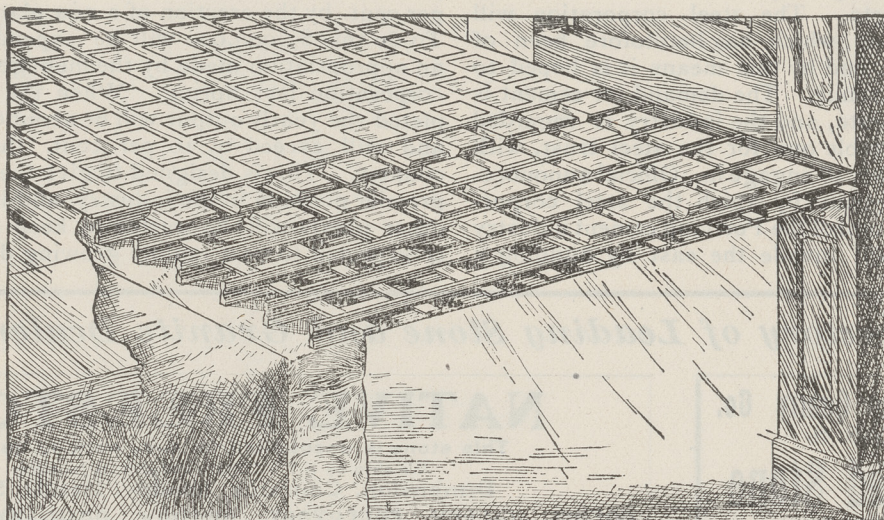


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plant near Pittsburg. The Universal Portland Cement Company, capitalized at \$1,000,000, took over on October 31st the plants and business of the cement department of the Illinois Steel Company. It is planned to increase the output of cement by nearly 150 per cent. by the erection of a new plant near Pittsburg. To do this \$3,000,000 will be expended—taken from an appropriation made by the management of the steel corporation last Spring. When the plants are completed the yearly output will be about 6,000,000 barrels and will exceed by 10 per cent. that of the entire country. This is designed to give the corporation the premier position in the industry, and it is probable that other plants will be started to keep pace with what is expected to be a rapidly growing demand.

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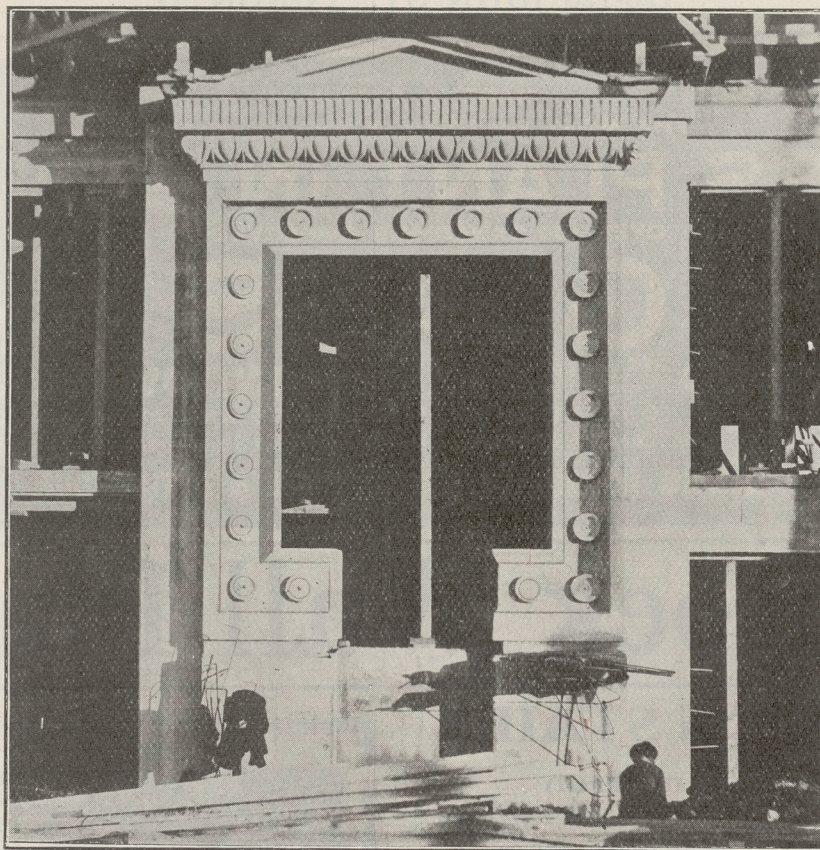
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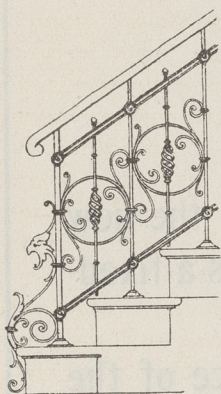
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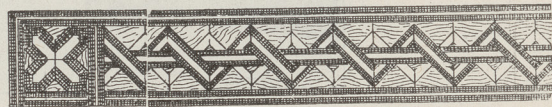
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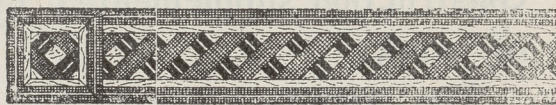


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Bricklayers and Concrete Construction.

An agreement has been made between the master masons of New York and the bricklayers' union that all the work of placing concrete is to be done by bricklayers. This does away, as long as that agreement is in force, with the advantage of cheap labour which is in favour of concrete. But it does not do away with the fact that concrete can be done by cheap labour. An artificial condition is created which it will be difficult to maintain. At the very outset—if a bricklayer is to take the place of every labourer required for the fulfilment of current contracts for concrete work—more bricklayers will be required than the union can supply. Will the union admit unskilled workmen to membership for the purpose of supplying bricklayers enough for this work, or will they hold up the contracts and injure the carpenters and other trades—to say nothing of the contractors, and possibly the law? It is evident that if this agreement is adhered to some of the forces that are making the history of trades unionism will be set in motion. A slight acquaintance with history suffices to remind us how the unrighteous exercise of power on the part of kings has always led to its curtailment, and there is nothing different to be expected in the case sectional tyranny of any other kind.

The Abolition of Closets.

Under the title "A Much Needed Reform," the *American Carpenter and Builder*, which probably represents popular opinion in the largest class of house builders, has inserted a contributed article which advocates the abolition of closets in the partitions of bedrooms.

The ground of objection is sanitary. Partition closets are apt to reach so far, that they get little light and imperfect ventilation. Professor Kerr has expressed all this long ago as the best English opinion.

The partition closet has two advantages:—the

quantity of space that one sometimes gets in them; and the saving in furniture. One would feel inclined to stand up for them, (with the condition that they should be planned so as to have a window for light and air), but for one objection—they spoil construction and lead to degenerate planning.

The proper construction for wooden interiors is undoubtedly that every upper partition should stand on the head of a partition below. If the upper partitions stand on the joists, the whole fabric is at the mercy of shrinkage; and, when bedroom partitions are double, (to provide closets between them), this condition is a necessity. Then follows the attitude of the average Canadian householder in a new house; patiently waiting for "the cracks" to develop in the plaster, before he papers.

As to resulting degeneracy in planning:—when upper partitions are placed without reference to those below, there is a great loss of "backbone" in the plan; and a tendency to pettiness in style is the result.

Noise in its Sanitary Aspect.

A paper read at a meeting of the Sanitary Inspectors' Association in Blackpool, England, by Dr. Theo. B. Hyslop, states the evidence in proof of what we have all begun to suspect, that exposure to noise—mere noise—is exhausting. Much more is this the case when the noise occurs with sudden shocks, or is disagreeable to the ear; and, above all, when there is no cessation of it at night. The evidence of injury in the latter case is interesting and indicates how it is that constant noise results in derangement of the nerves, and, in too many cases, in derangement of the mind.

Observations made in the case of animals, and of men whose brains have been exposed by injury or operation, prove that the vessels of the brain contract during sleep and the brain grows pale, expanding again and taking on a rosy hue at the moment of awakening. The application of "graphic methods"

has shown that every sudden noise causes an increase of blood in the brain without awakening the sleeper. In other words every sudden noise presses action upon the brain; and we know from experience that it is not only the suddenness of noise but also its continuance that wearies us. Everybody knows the feeling of relief that comes over us when ventilating machinery stops, though we did not before notice its action or the strain it imposed on us. The peace of a snowy day in the city—when all sounds are muffled, and even the roaring of the trolley cars is subdued—is also a thing that haunts the memory. The enjoyment of these moments of peace is a measure of the strain that is upon us when, however uncsciously, we are bucking against the noise. It is this strain that is wearing us out; sending some to travel and others to be shut up in asylums; but for most of us, who are not liable to break down—or are not liable to break down *yet*—just keeping our brains uselessly active all the time; adding to the effort of life and subtracting from the strength available to meet it.

The question of course is how much of this we must bear and how much we need not. Mitigation of the main trouble means large dealings with the street traffic which is the main source of noise. What has been done already in this way is an indication of what can be done. A generation is growing up, in this country, which has never known what the noise of a cart on cobblestones is like. The change that has resulted in London, by the general adoption of rubber tires, is to be measured by the astonishment with which, when watching the smooth going of the carriages along the drive in Hyde Park, one hears approaching from the distance the rumbling of a steel-tired carriage that some old fashioned person has brought up to London from the country. The London of Penderennis must have had a very noisy splendour. They have a new noise problem now in London in the shape of the motor busses. If one may judge from the outcry about them, there will be some effort to get rid of their noise, made in time to be of service to us when this form of transport reaches us. In the meantime our large problem is the trolley car, before which motor omnibusses are silent and ashamed. If it survives as a means of transport, it will probably go underground to leave more room on the streets, and so we shall get rid of its noise when we are not using it. But this is merely speculation about the future; what can be done now is of more importance, if in a smaller way.

If we reflect upon the numerous noises that combine to heap annoyance on us, it is surprising how many of them are of a private character, which no man can have a right to inflict upon his fellow citizens and which therefore may be restrained. They are part of our general carelessness about living, and it is to be feared, if examined into closely, would be found to be the indirect result of a lax or undeveloped public morality. We let others do to us what in the same case we would be likely to do to them.

A manufacturer who wants to intimate to half a hundred employees—all waiting within sound of a hand bell—that it is time to go to work, blows a whistle that makes a noise a mile away. Piano organs, with the terrible mandolin touch, can bray the most painful music over and over for half an hour in one

small area. The seductions of cheap amusement are now-a-days indicated by a phonograph, turned out of doors and delivering raucous noises into the street. Negro minstrels—foreign negro minstrels—are free to march down our streets and bang rag-time into the ears of horses that are accustomed to classical music. In building operations the signals intended for the ear of the hoisting engineer are delivered to a whole neighborhood. Anybody who wants to advertise anything can ring a bell, blow a horn, or shout. Anybody can shout, so long as he does it every day.

How differently they manage these things in Germany. Only the other day we had in the telegraphic news from Berlin an account of two men who were arrested for loud sneezing. Sneezing! There is a fortune awaiting the man who can sneeze loud enough to be heard across one of our streets. He need do nothing henceforth but take snuff and charge admission. It was doubtless to amuse us that this piece of news was given to us by cable; and it did amuse us. But, when one comes to think about it, should we not be the better for a little paternal legislation in the matter of noise.

The representative in New York of an eminent firm of German booksellers used to visit the offices of architects in this country. On one occasion he came after having visited Germany for the first time in twenty years. He had found himself an American in habits of mind, and Germany was strange to him. In particular these paternal restrictions to free action gave him annoyance. He threw a piece of paper in the street; a policeman made him pick it up again and pocket it. He tried to smoke on the tail end of a street car; the conductor tapped him on the shoulder and told him he must not. He had to behave himself in ways that were strange to him, and disagreeable. He wanted to go back to New York and be happy. "But presently," he said, "I reflected that all these things they would not let me do were things I ought not to do. I began to look at things in another way, and came to the conclusion that paternal government was a good thing, and that I liked living under it better than living in New York." This is the testimony of a New Yorker to the enforcement by law of such consideration for the feelings of the community as would be observed by considerate people. If some enactments of the kind were made in Canada, so as to prohibit preventible noises, there would be something done to relieve the waste of energy involved in living in cities.

We appreciate very much the many kinds expressions regarding the CANADIAN ARCHITECT AND

BUILDER received from time to time from its subscribers. It would be of great assistance to us if those subscribers who have found the paper valuable and interesting would kindly recommend it to their neighbors and friends. We would like to add to our present list of 3,500 subscribers at least 500 new names during 1907. We solicit the kind co-operation of our subscribers and friends for this object. Will every present subscriber make an effort to help us to the extent of sending us the name of at least one new subscriber during the coming year, or the name and address of some person who might be induced to become a subscriber.

THE UGLIFICATION OF OTTAWA AND QUEBEC.

We hear a great deal of talk about the beautification of Ottawa, but to an old inhabitant of Ottawa, visiting it again recently, after some years of absence, the first impression is that the general beauty of Ottawa is less than it was. It has received irrecoverable injury from the entrance of the C. P. R. into the middle of the city from across the river. Formerly the view from the bridges over the canal was agreeable on the side of the "deep cut;" and, on the side towards the river, there was a view which would be a possession for any city; looking down the wide descending ravine with eight locks connecting the canal with the river; a high bluff on each side; the Parliament Buildings on one, the trees of Major's Hill on the other; the wide river at the bottom, and, beyond, the range of hills on the Gatineau. Here was a noble composition which though viewed from the very centre of a city had no note of the ugly necessities of city life. A saw mill on the opposite side of the river had pictorial value as a distant object. The descending locks were picturesque in themselves and interesting as a spectacle when in operation. The ravine, with the locks running down the bottom as a central object, was a natural composition. But all that is changed. On one side the ravine is ledged to let the C.P.R. come in from across the river. The ravine, the fore ground of the view, is thus ruined for ever, and a large cantilever railroad bridge dominates the whole scene, crossing the river in the middle of the view. We have been trying hard for a generation to acquire a taste for iron as an architectural material; but it is of no use. Iron is not an architectural material. Whatever it may turn out to be as a material for use in concealed construction, as a visible object there is no doubt about its objectionableness. Iron is ugly, and an iron bridge is an ugly object. Its only merit is size, which puts it out of scale with the rest of the landscape. All this change—drawing ugliness across the scene on one side of the bridges, and making a shunting yard of the old canal basin on the other—is in order that a railway, that has already entered the city not far from the centre, may have a new entry and another station. Whatever the convenience of the present station, it is not enough to make up for the disadvantage of its position. There is always a precisely right way of doing everything. It requires only two conditions—thought, which people are sometimes willing to give, and money which they cannot always find. But in a case concerning the beauty of Ottawa, somebody ought to have supplied the thought; and, if a station in another spot—a Union Station avoiding all the inconvenience of the present double arrangement, cost more money—which is doubtful—there would be no great hardship in requiring the C. P. R. to spend it.

Both thought and money are being spent now in beautifying Ottawa by details. The details may be beautiful when one gets to them, but the one point where everybody gets to every day was beautiful enough if it had been merely preserved from ugliness, and that was been allowed to invade it.

Another railway is threatening Quebec. The C. P. R. got in its work there too, in getting for its hotel a site that impinges upon Durham Terrace, if it does not actually invade its area. By great good fortune the hotel building is not amiss. Its scale is a little over-

powering for the Cape, but scale is increasing all over the town and whatever the total effect may be, the size of the hotel is likely to be balanced. It may also be said with truth that the great view from Durham Terrace gives pleasure to more eyes and does more good to Quebec when the Terrace site is occupied by an hotel than if it were occupied by a public building. But this is a happy accident. These benevolent purposes are not likely to have directly actuated the C. P. R. in getting possession of the site nor of the party—the party in power—who gave it to them. The public needs to beware of the railways. Their service is necessary but it is not necessary that they should be our masters. They are concerned only with making money. The amenities are nothing to them; and, when they are taking steps to destroy beauty in order to save themselves money, they do not first lay the matter before the public who value beauty. They lay the matter before some one who will get it "through" for them with the least disturbance, and, before the public know anything about it, the thing is settled beyond recall.

It is probably news to most of our readers that the Champlain Market at Quebec, the foreground of the view from Durham Terrace, (or Dufferin Terrace as it seems to be all called now,) is doomed, in order to serve the purposes of the Grand Trunk Pacific. That railway will have its station right under the terrace; and instead of the Champlain Market—a respectable building, in the right scale, sufficiently imposing without attracting too much attention to itself—we are to have a passenger station which is sure to be big and must be either truthfully ugly or falsely and painfully fine; and, seen from above as it will be, will probably show up as both ugly and false. But the building is only an item in the change. The exchange from the human interest of the market to the ugliness and noise of a train yard is painful to think of. Who will want to hang over the railways of the terrace when this substitution is made? It will be no more all delightful. The distant view will remain, but one will shrink back from the edge to look at it and try to forget the existence of the railway.

Is this necessary for the prosperity of Quebec? Not a bit. The prosperity of Quebec is bound to come with the increase of the tonnage of steamers, which makes it difficult for them to go up to Montreal. When commerce was carried on by sailing vessels, which could not get further than Quebec without the aid of steam tugs, Quebec was an active port. With the increase of steam and the decrease of sailing vessels its importance declined, until now, as a port, it is almost dead. But its turn is coming again. Already the large C. P. R. steamers have to make Quebec their terminus. The Grand Trunk Pacific is building the biggest steel bridge in the world in order to get there in time for the trade; and it would get there all the same if it had been forced to go round behind the town and enter at St. Roch's. There are docks there and room for more, so that it could do some of its freighting business there as well as the delivery of passengers—which is all this article is intended to advocate. For passengers, the hills on this side of the town are far the more convenient for coming and going to a station. Mountain Hill is too steep for a loaded cab. It would be really less strain upon a horse, drawing a load from Champlain Market, to go round to Palace Hill. Ocean

passengers it is true may be a little nearer their docks, if they detrain at Champlain market, but they will not be in contact. It is not proposed to entirely oust the cabman; and, so long as there must be vehicular connection, a little more or less would not matter. There are no great distances in Quebec; nothing to compare with the distances in New York, which have not at all injured the reputation of New York with ocean travellers. For whose advantage then is this entry of the Grand Trunk Pacific into the lower town along the water front? So far as one can see the advantage is only for the railway. The descent from the bridge is easier, it is said, along the river than across the promontory and down on the other side. Cheaper it may be to construct, but it is hard to see how it can be easier, as a grade, when the ultimate level is the same and the distance to St. Roch's is greater. The obvious reason is that the great objective of the railway is the coves where the shipping of freight will be done. The road along the old coves, underneath the cliffs descending from the plains of Abraham, has always been and, even now, in the ruined state of the coves, is a delightful piece of picturesqueness, kept so by the fact that the old traffic in square timber required no railroad. The freight, floated down the river, met the ships at the piers; and the road along the shore was merely a narrow street lined by the dwellings of the workers in the coves; with the usual church among them, built on the very edge of the river, so that one could fish over the railing of the churchyard. All this of course has got to go. Freight will now come down by rail. The new coves will be no doubt the small end of one of the funnels into which the northwest wheat is poured; and when Quebec is busy again there will be rails, trains and smoke in plenty along the coves. There could not be a better place to carry on large traffic in connection with a city without injuring the city's beauty. The riverside here is round the corner from the city, at its point of outlook from Dufferin Terrace; and the Plains of Abraham above are so well above as to receive no injury, or none that would weigh in the question. But this admirable plan, so well arranged by the accident of the Cape's projection, is to be upset by the proposal to extend the railway round the corner in order to bring in passengers where there is no real need to bring them in.

A proposal to prohibit this injury to Quebec is not reactionary, but the reverse. This will be the judgment of the future and a near future too. Such a proposal would not be tolerated for a moment in the United States in the case of a city like Quebec, with great natural beauty preserved so wonderfully up to the present time. They are a generation in advance of us in these matters; and we limp behind, copying their discarded vices; like regular second-raters, incapable of seeing the merits of those they aspire to imitate, and copying only their defects.

PERSONAL.

Mr. F. S. Baker F.R.I.B.A., has removed his offices to the new Traders Bank Building, Toronto.

Mr. G. A. Hodgson, of Ottawa has patented and is placing on the market a safely revolving window.

The steel square, as a calculating machine is a recent publication from the pen of Albert Fair. It contains simple directions for using the common steel square for difficult calculations that are met by carpenters, builders, lumber dealers, plumbers, etc. Some of the practical questions dealt with in this little book are the choice of a square; lines, surfaces and solids; right angles and right angled triangles; polygons.

R. I. B. A. LOCAL EXAMINATIONS.

The Canadian examinations were held in Toronto on November 16th, under the direction of Mr. F. S. Baker, F.R.I.B.A., Honorary Secretary for Canada of the Institute. Three candidates entered for the examination but only two, Mr. A. E. Anderson and Mr. K. G. Rea, were able to attend. Both came from Montreal. The papers are returned to England for examination; but the local examiners hold an oral examination, and report the result, as contributory evidence of the candidates qualification. The local examiners this year were Messrs C. H. C. Wright, Professor of Architecture in the School of Practical Science, Toronto; Percy E. Nobbs, Professor of Architecture in McGill University, Montreal; and W. A. Langton, Architect, Toronto.

THE CANADIAN ARCHITECT & BUILDER COMPETITIONS.

A correspondent writes:—

I am a student. I intend to try the third competition; but I think that it is given on a field too large, and that there are not sufficient explanations given, as to the size of grounds, as to the height of the shop, and as to the approximate cost of the whole house.

The reply to this letter was as follows:—

The intention of these competitions is a variety of designs and, for that purpose, the conditions are not laid down too closely.

You have chosen the problem which is most fixed in its conditions. If I add that a shop of this description would usually have two storeys above the shop I should fix the whole front. (The depth from front to rear is supposed to be, as such lots always are, sufficient for a shop with a dwelling over it). I can however conceive that a shop front with one storey and a roof storey over, or two storeys and a roof storey, would be desirable designs; and I do not wish to limit the possibilities to two storeys only.

There will, I think, be no difficulty in comparing the excellence of two designs of different size.

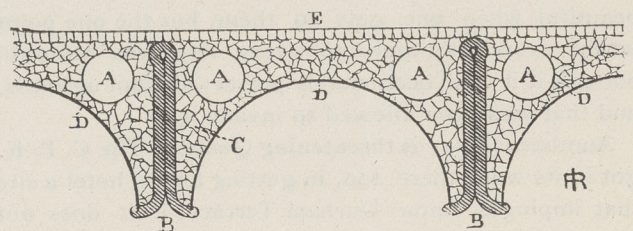
FLAT FIREPROOF ROOF.

A correspondent of the *Building News* sent to that journal the following suggestive letter:—

Why we in England are so fond of the ugly timber and slate roofs which everywhere abound, I cannot explain; but to those who have live in South Europe, where the roofs are nearly always flat, it is apparent that there are many advantages over our usual form.

I send you a sketch of a plan for a fireproof roof of the better sort. B B are steel girders connected by semi-cylinders, D D, of enamelled iron, so that with proper attention to colour the ceiling below is already made washable and almost indestructible. A A are tubes of thin iron which are put in to save weight. C is the concrete filling, which may advantageously be made of a mixture of broken limestone or marble, pumicestone in small fragments, and Roman cement, with, of course, the proper quantity of water. E, the surface of the roof, should be of the tessellated and cemented mosaic work which one now so often sees laid down in front of shops. Some of these I have had under notice for years, and although they are fully exposed to sunshine and to frosts, they do not show any weather cracks, so I presume they would behave similarly on a roof. The tubes A A are, of course, propped in place by temporary supports when the concrete is poured in.

The girders, I think, might be as much as 2 ft. 6 in. apart, and the marble and pumice ought to be had cheaply. The principle



is somewhat that of a human bone where one has a light cellular middle encased in a harder covering or shell.

OUR ILLUSTRATIONS.

DOCKLANDS, INGATESTONE, ESSEX.

Most villages in the agricultural districts of England have a house or two of the larger size closely connected with them. Often the entrance is from the main street; but the house is likely to be retired in grounds which according to our standard would be called large. Of this class is the home before us which is worth examining as an example of the great simplicity that is usually found in the design of such a house.

The south side of the house looks upon the lawn and flower borders; the north side looks towards the village



street from which the house is approached by a drive of some length overshadowed by trees. The principal rooms give upon the lawn side, and on the ground floor open directly upon the gravel walk. The service department is in a wing a little retired, (towards the front), and looking upon the kitchen garden.

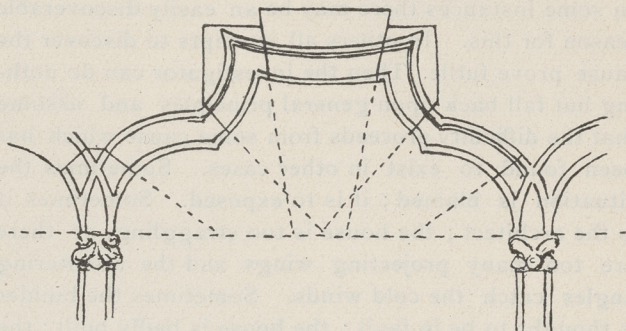
An interesting feature in most English houses of this type is a broad gravel walk, somewhere in the garden, protected on the north by a brick wall, so as to make a warm place in winter, where elderly or contemplative people, can "secure a walk" in the fine part of the day. There is much green in an English garden in winter, and, in such a garden as this, even in the northern counties, there would be more than a dozen kinds of flowers blooming in February.

THE AGED WOMEN'S HOME, TORONTO. MESSRS. LANGLEY AND LANGLEY, ARCHITECTS, TORONTO.

This institution is now twenty-three years old, and has grown in that time from the use of a few rooms, set apart in another institution for the accommodation of aged women, to the point that a new building, containing accommodation for a hundred, is found to be necessary. The purpose of the institution is to provide comfortable and suitable accommodation, with a room that they can call their own, for aged women whose relatives, though willing to support them, are not able to accommodate them comfortably. The promoters of this excellent work have been properly praised in the newspapers, in the reports of the ceremony of laying the foundation stone on the 12th of this month. It remains for this journal to mention the name of the architect, and to direct attention to the satisfactory character of his work. The design was selected from several sent in in competition. The theme—an aggregation of similar small parts—naturally tends to simplicity. The one emphatic point, the entrance, will get more emphasis in perspective than in the elevation before us.

CASA DE LAS CONCHAS, SALAMANCA.

The shells (*conchas*) which enrich the facade of this building are the heraldic badge of the owner. The *reja*, or wrought iron screen, protecting the lower window is interesting. The fantastic character of the



courtyard design has the merit of harmony—harmony with variety.

The jointing of the lower arches, shown in the cut, is reproduced from a sketch.

HOUSES OF SMALL COST IN A COUNTRY TOWN. NO. VI.
DESIGN SUBMITTED BY 1,500.

This drawing, the last of those selected from the CANADIAN ARCHITECT AND BUILDER competition of last February, has been kept back hitherto because in the zeal for secrecy as to the names of the competitors the name of this competitor has been lost, and efforts to discover it have been unavailing. Perhaps the publication of the drawing may make it known to us.

The design was selected for publication chiefly on account of the combination of style and economy in the exterior design. In other words it is a good cottage design.

The plan could be made comfortable if the partition between the living room and hall was run right across the house, with a door opposite to the stair, and the fireplace turned to open in the living room. As the west end is in close connection with the kitchen it will be, (as shown), the dining end of the living room, where the fireplace will be less convenient than at the other end. This incompatibility between the best position of the fireplace and its distance from the kitchen is apparently to be bridged only by the erection of two chimneys, if the plan is to remain otherwise as drawn. There ought to be a furnace flue included in the kitchen chimney so that this chimney would remain as it is shown in the upper floor. A single flue for the fireplace would not occupy much room in the closets of the bedrooms in front. As to the cost—one can only say that it would be worth while.

THE ONTARIO ASSOCIATION OF ARCHITECTS.

The Annual Convention of this Association will be held on January 15th next at Ottawa. In addition to papers that are being arranged for, it is proposed to make visits to the park improvements, the buildings on Parliament Hill and the site of the proposed buildings on Major's Hill. This is the first time the Association has met outside of Toronto, where the greater number of architects live. There have often been proposals made by members living in other towns that the place for holding the annual meeting should vary. The first proposals came from an Ottawa member. It is an excellent idea, if well carried out, but will involve some activity upon the part of members residing in the place of meeting, so that the convention may be well attended and the discussions warm. It is expected that the papers will maintain the standard of interest of recent meetings.

WHY SOME HOUSES ARE COLD.

There are many buildings, especially dwelling houses, in which great difficulty is experienced during cold weather in raising the temperature to the point considered necessary for comfort and maintaining it there. In some instances there may be an easily discoverable reason for this. In others all attempts to discover the cause prove futile. Then the investigator can do nothing but fall back upon general principles and assume that the difficulty proceeds from some cause which has been found to exist in other cases. Sometimes the situation is blamed; it is to be exposed. Sometimes it is the architect; the house is too straggling, or there are too many projecting wings and the re-entering angles catch the cold winds. Sometimes the builder is thought to be in fault; the house is badly built; the joints of the brickwork have not been properly filled and the wind whistles through them; windows and door frames have not been so set as to exclude draughts; unseasoned wood has been used, causing shrinkage and consequent draughts. Or—and this is most likely the first thing to be thought of—the heating apparatus is denounced and declared to be “no good.”

Undoubtable any one of these things may be the cause of the difficulty, or several of them may be contributing to it. But there is another point which is seldom thought of, and the investigation of which will often lead to the true solution of the problem. Although not perhaps so obvious as some of the others it is not at all mysterious. Unfortunately indeed it is often more easily discovered than remedied. The first thing to be done when attention is being directed to this point is to take two similar thermometers and hang them in the same room and at the same level, one on an outside and the other on an inside wall. Some judgment must be exercised in determining the positions of the thermometers so that one of them may not be exposed more than the other to any disturbing factor. If thermometers of the ordinary type mounted on a wooden block are used, they must be allowed to hang long enough for the true temperature of the wall to communicate itself through the wood block to the bulb, for wood is a slow conductor. When a sufficient time for this to take place has elapsed, it will almost invariably be found that a higher temperature is indicated on the thermometer hung on the inside wall than on that on the outside one. Why? Because the temperature of the rooms on each side of the inside wall is probably about the same while there may be a difference of many degrees between the temperature of the room and that of the outside air. It is not surprising therefore that the temperature of the outside wall should be lower than that of the inside one. Indeed some difference is almost inevitable, even in a thoroughly well built wall, owing to perfusion of air through its substance. But if the difference between the reading of the two thermometers is considerable, some other explanation must be sought for. And if the wall is a furred and lathed one it will probably be easily found. The object of the furring is to interpose an air space between the outside wall and the plaster, in order to prevent dampness from showing on the plaster. Theoretically this air space ought to add to the warmth of the room by interposing a layer of dead air between the lower temperature of the air outside the wall and the higher temperature of that in the room, because dead air is an

excellent non-conductor. But the air in this space never is dead. On the contrary it is usually in active circulation. Further, it is cold air because it is fed from every crack through which a draught steals in.

A great deal is thus accounted for, but—and herein lies the crux of the whole matter—the chief source of the supply of cold air is usually the space between the upper ceiling and the roof. These spaces are proverbially hot in summer and cold in winter, unless indeed the roof covering happens to be of thatch. As roofs are usually constructed there is but little thickness of material to serve as a barrier between this inside space and the outside air. Further there are always numerous cracks and crannies through which cold air is freely admitted, especially about the eaves. Any one can easily verify this statement by going up into such a roof space where there is no window or skylight, and noticing the daylight streaming through these unauthorized openings. Even with a flat roof the same defect is usually present, only it is not so readily discovered. This cold air falls by gravitation down the spaces between the wall and the lath and plaster. If any further proof of the truth of this theory than that afforded by the thermometers is required, it can easily be obtained by boring a gimlet hole through the lath and plaster and holding the hand opposite the hole, when the stream of cold air will at once afford the necessary demonstration. This air will often be found to be of little higher temperature than the outside air.

The practical result of this is that many a house which has been honestly intended by all concerned in building it to be well and substantially built in every way, turns out to be anything but a comfortable dwelling place. No expense may have been spared in making the walls of ample thickness “for the sake of warmth,” as the unsuspecting owner remarks, fondly imagining that he is going to have a substantial barrier between him and the cold that will keep him snug and warm when the frost is keen or the wind howls and the snow is drifting and that, incidentally, will also help to keep down the amount of his coal bill. He does not know that instead of having a thick wall between him and the cold outside air he has only in reality a bit of thin lath and plaster. It is hardly surprising that he should wax wroth and say things when he makes the unpleasant discovery. His annoyance is not lessened by the consideration that it is by no means an easy matter to remedy a defect that might have been quite easily obviated. Some simple precautions are all that are necessary. For instance the walls should be carefully built with every joint filled full of mortar. The roof should be constructed so that there will be no crevices to admit cold air, and non-conducting materials should be freely used. Then if the walls are to be furred the spaces thus formed should be carefully stopped at top and bottom so as to form dead air chambers. This may be done by a projecting course of bricks on which the furring strips would butt at each story. This indeed should always be used as a precaution against spread of fire. But it is better to do away with the furring altogether and build the walls hollow. In any but the very thinnest walls this would cause no increase of cost as the saving of the cost of furring and laths would easily pay for metal wall ties.

Even after a house has been completed the trouble,

if it cannot be entirely cured, may at least be mitigated by the stopping of roof crevices, and by stuffing the tops of the spaces between the lathing and the wall with mineral wool or some similar substance. It is not however always possible to get at the wall head to do this. Then the only alternative is to cut out a strip of plaster below the ceiling along the whole length of the outside walls and then to do the stopping in any way that may be found expedient in the particular case.

If architects would keep this subject in mind when preparing their plans and specifications, and make provision therein for the necessary precautions being taken, and if builders and their men would take pains to see that these precautions were efficiently carried out there would be fewer complaints of cold houses, and much discomfort and many disappointments would be averted.

D. B. DICK.

ILLUMINATION OF THE ROYAL ALEXANDRA HOTEL, WINNIPEG.

By EARNEST C. WHITE, M. L.*

In point of size and excellence of architectural design The Royal Alexandra Hotel at Winnipeg will doubtless

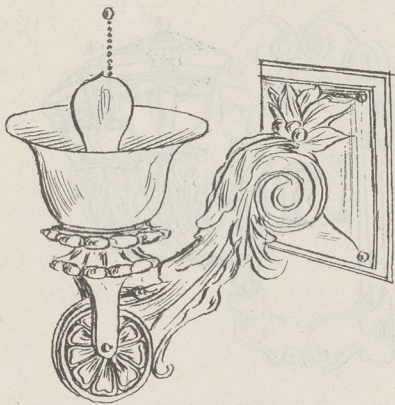


FIG. 1.

be preeminent in Western Canada for some time. The scope of this article however, does not permit

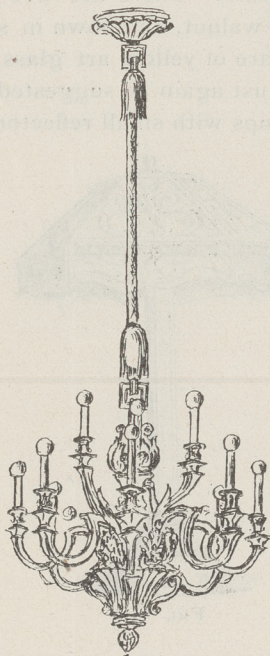


FIG. 2.

remark upon even the most notable features, except the lighting of some of the principal rooms.

The "L" shaped rotunda on the ground floor extends

along nearly the whole of the south and west sides of the building, and is about 60 ft. wide, or a total of about 11,000 sq. ft. In this space columns are located, forming bays about 20 ft. square. At present the only lights are those supported on cast bronze brackets,

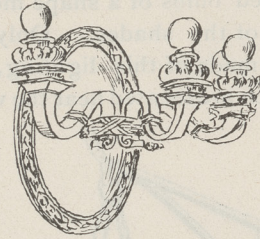


FIG. 3.

ets of the general design which is shown in Fig. 1; there being four of these brackets on every column. Each bracket is equipped with a 16 c. p. lamp in a 6" opalescent shade. There are about 130 of these brackets, all located so that the lights are about 7 ft. above the

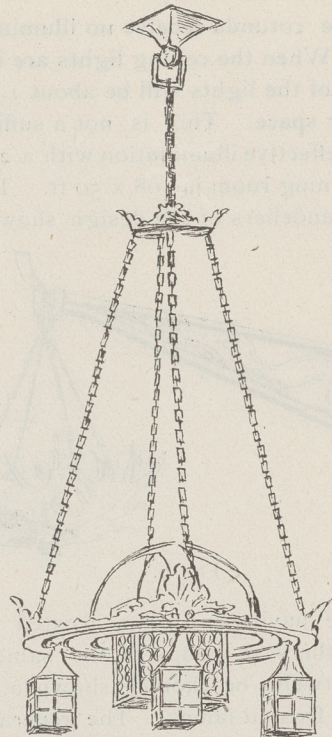


FIG. 4.

floor. Provision has been made for seven chandeliers or ceiling lights, which are not yet installed. These will greatly tend to improve the present illumination, which is somewhat trying on the eyes on account of all the lights being in the same horizontal plane and

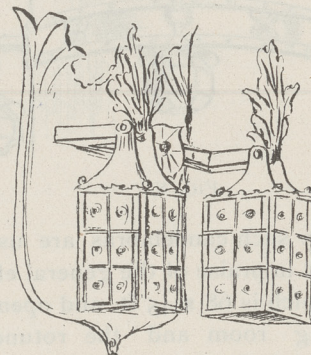


FIG. 5.

directly in the line of vision. It is interesting to note that a certain appreciable eye strain was experienced while the intrinsic brilliancy of the lights was greatly reduced by roughed inside globes, which were used

*Engineering of Illumination, 88 Princess Street, Winnipeg.

temporarily before the delivery of present shades. This objection should be obviated when the chandeliers are installed, as the bracket lights will be less trying in view of the greater average illumination, although doubtless the present clear bulbs will eventually be replaced by frosted bulbs of a shape more in keeping with the design of the shades. Only one serious criticism can be made of this lighting, viz: that the reading tables which are located near the windows along

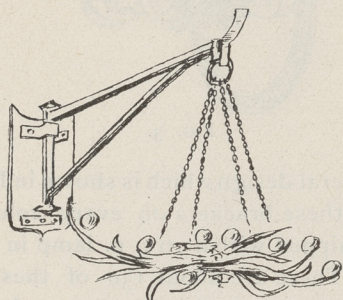


FIG. 6.

the sides of the rotunda receive no illumination worth mentioning. When the ceiling lights are installed the total capacity of the lights will be about 1.2 watts per sq. ft. of floor space. This is not a sufficient allowance for very effective illumination with a 20 ft. ceiling.

The main dining room is 108 x 50 ft. This is lighted by three chandeliers of the design shown in Fig. 2,

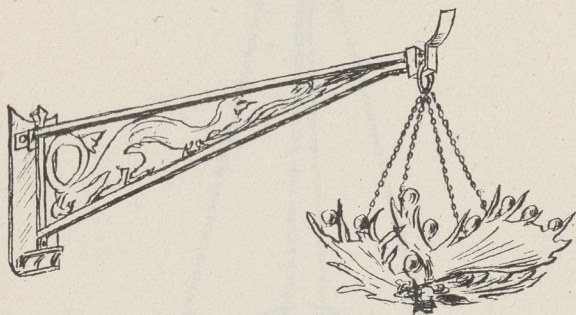


FIG. 7.

the central one having 24-6 c.p. frosted lamps, and each of the others 16 lamps of the same capacity. There are also twelve brackets as shown in Fig. 3 each having 4-6 c.p. frosted lamps. The general effect is a very pleasing ground work of mild illumination, which is entirely sufficient when table candelabras are used. Floor receptacles are provided at frequent intervals.

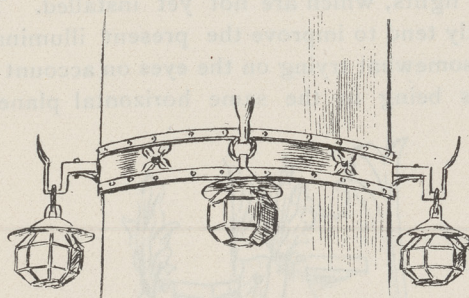


FIG. 8.

and a great many such candelabras are used, so that much can be said in praise of the general effect.

In the café, which is 68 x 45 ft. and opens into both the main dining room and the rotunda, a very different form of fixture is used. There are eight chandeliers and twelve brackets of the design shown in Figs. 4 and 5, these being of wrought iron with leaded glass lanterns. The effect is good from a decorative standpoint, the only crudity being in the use of clear, instead of half frosted lamps

in the smaller lanterns which are open at the bottom. The use of prismatic shades over these lamps would also greatly increase the general illumination of the room without destroying the artistic effect, as the shades would be entirely concealed, but would prevent the present very high degree of absorption.

In the bar, wrought iron brackets, as illustrated in

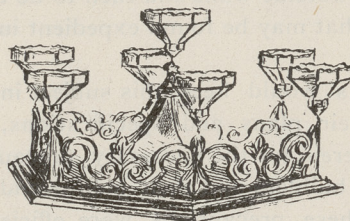


FIG. 9.

Figs. 6 and 7, are used to support antlers wired for 8 to 10 lamps each. There are also sixteen bracket lanterns supported on four columns as illustrated in Fig. 8. The general lighting is quite sufficient for all purposes, although the use of 16 c.p. clear lamps on four of the antlers is not quite in harmony with the very artistic surroundings.

On the first floor an excellent example of modern

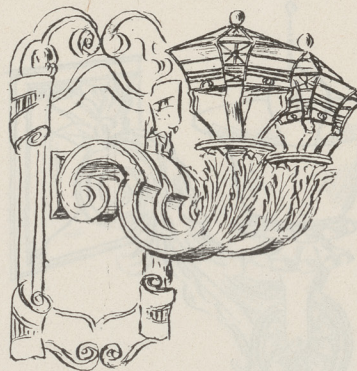


FIG. 10.

illumination may be found in the drawing room, which is 64 x 50 ft., the prevailing decoration being old gold with walnut furniture. There are five 7-light ceiling fixtures of carved walnut, as shown in sketch, Fig. 9. The shades used are of yellow art glass with bare 16 c.p. lamps. It must again be suggested that the use of half frosted lamps with small reflectors fitting over

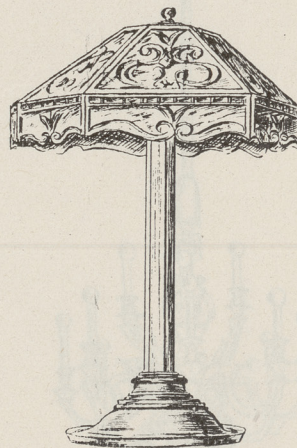
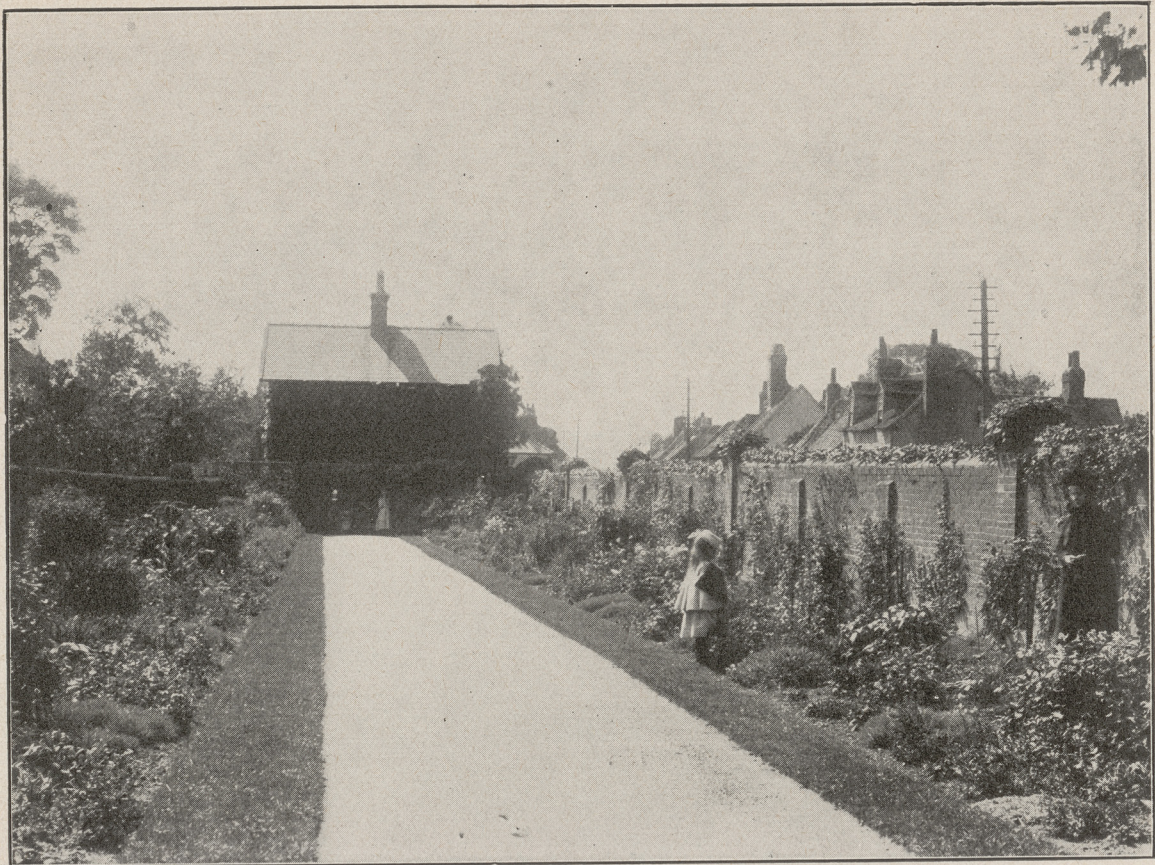


FIG. 11.

the lamp and concealed within the art glass shade would add refinement to the scheme, and at the same time increase the general illumination of the room. In addition to the ceiling fixtures there are eight 3-light brackets, of general design as shown in Fig. 10. The 8 c.p. lamps used on these brackets are completely

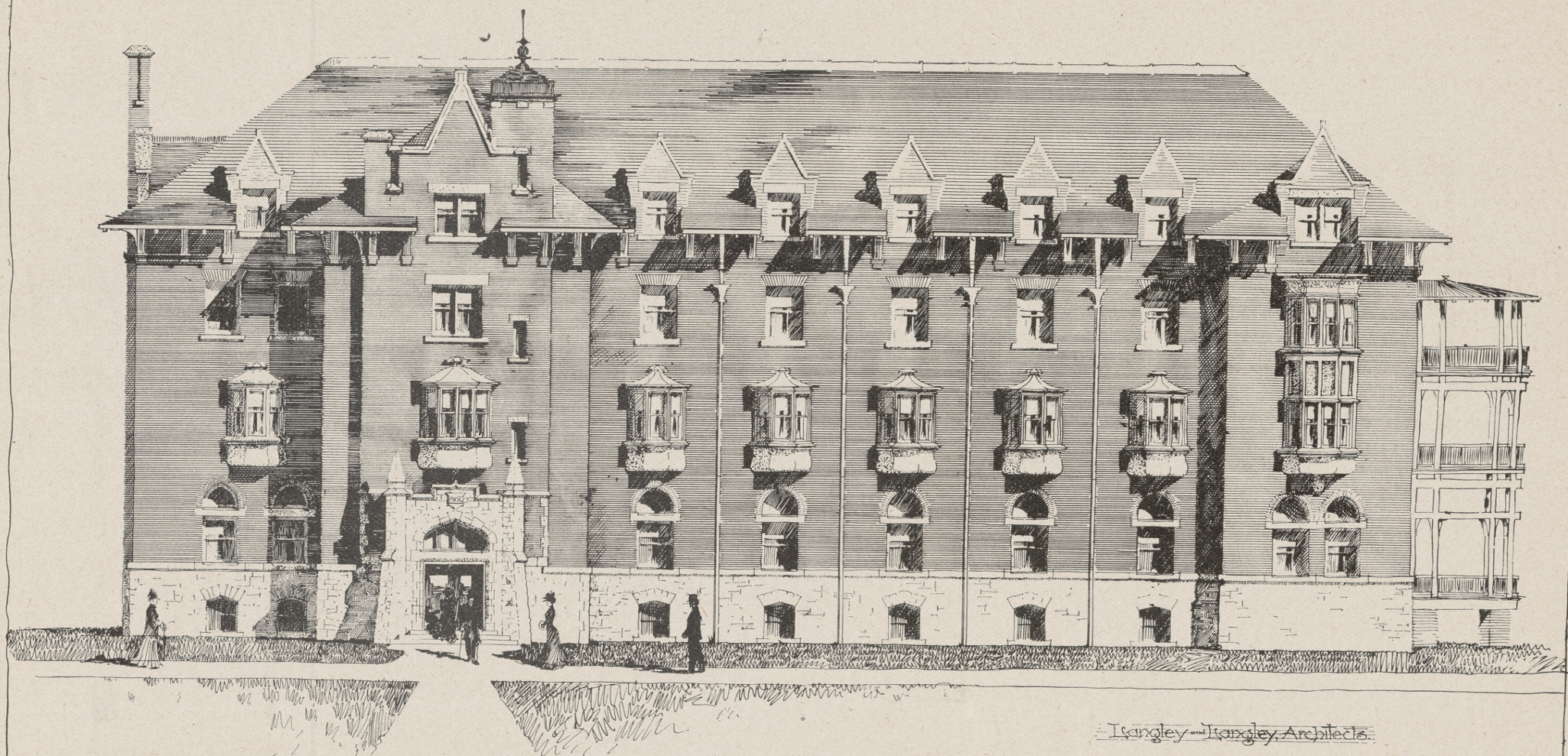


SHELTERED WALK.



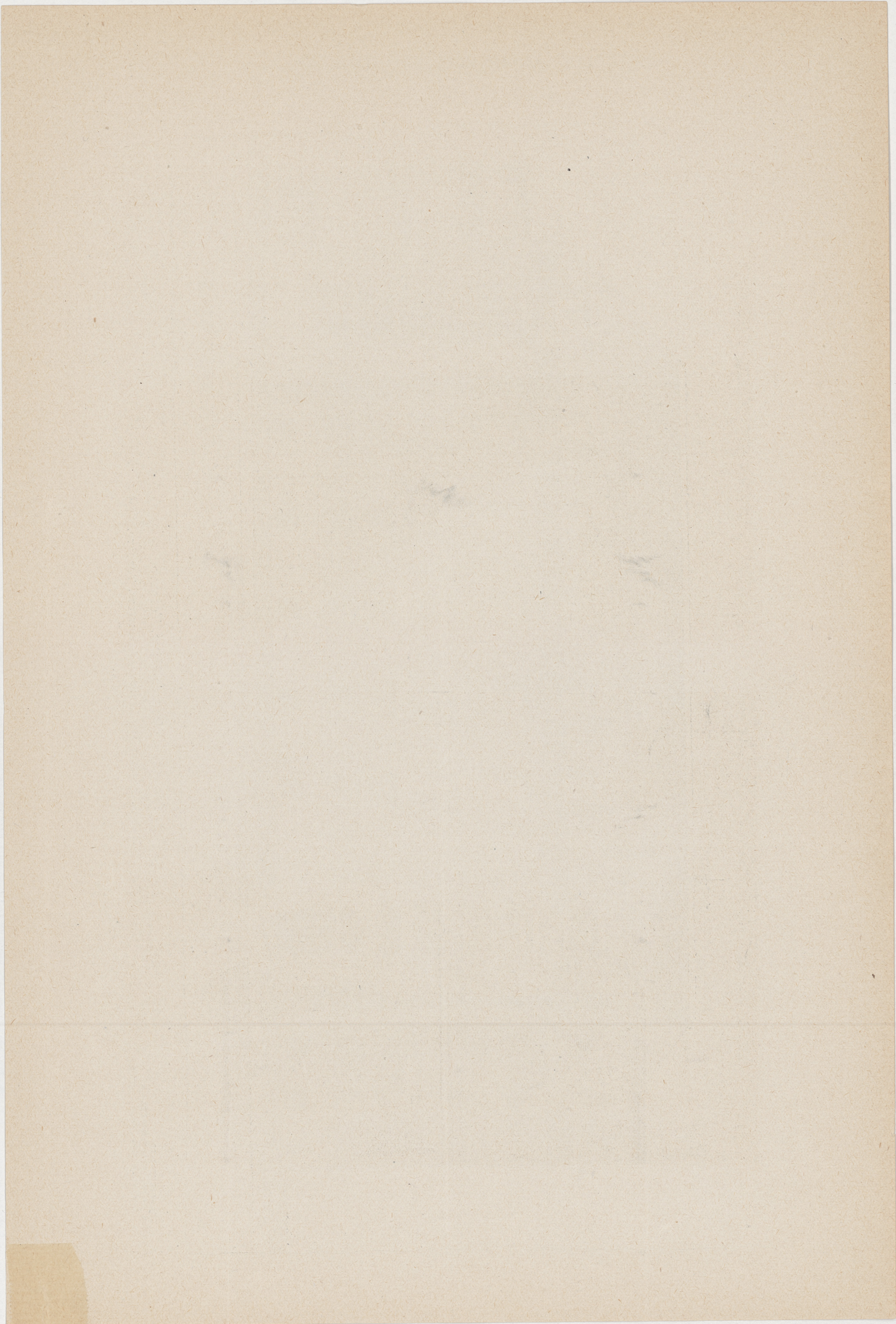
GARDEN FRONT.

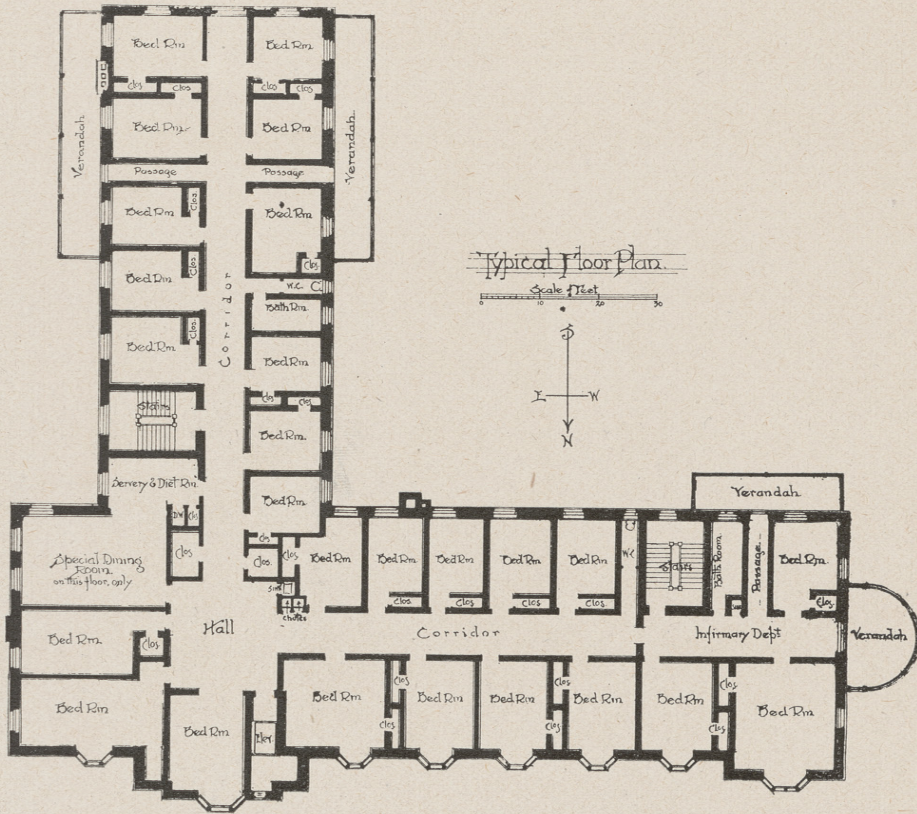
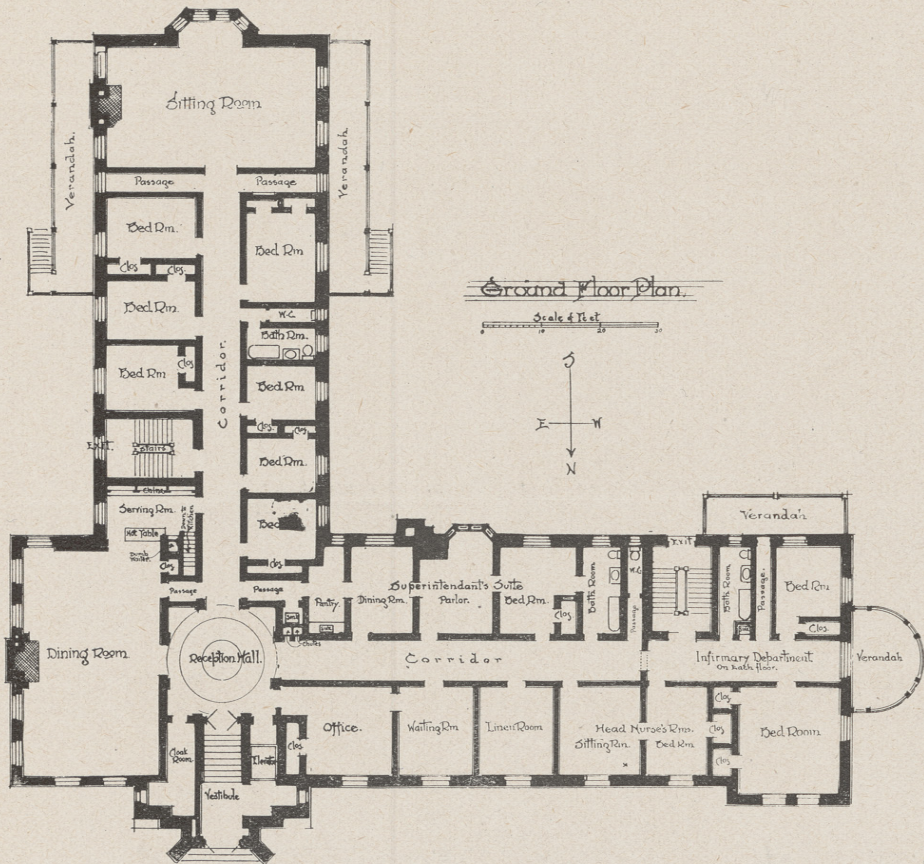
DOCKLANDS, INGATESTONE, ESSEX, ENG.



SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1906

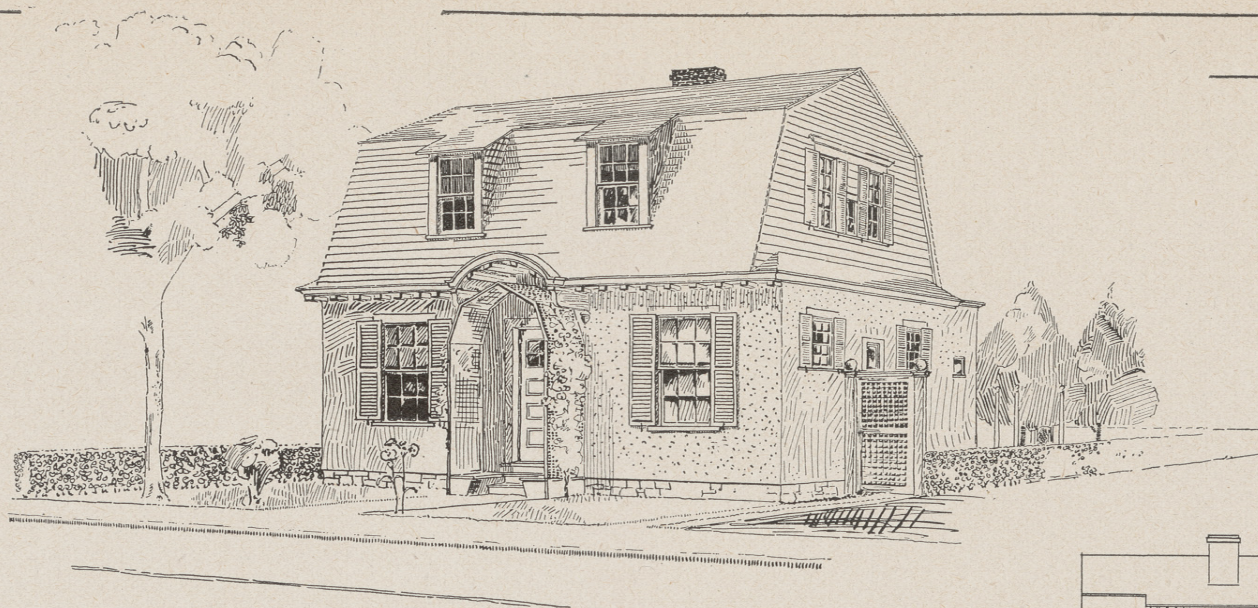
THE AGED WOMEN'S HOME, TORONTO.
MESSRS. LANGLEY AND LANGLEY, ARCHITECTS, TORONTO.
FRONT.





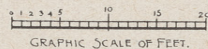
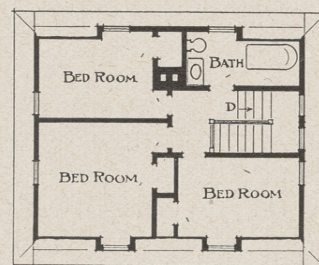
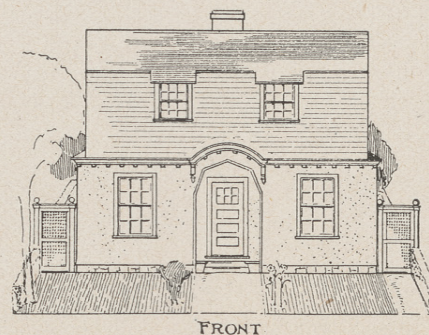
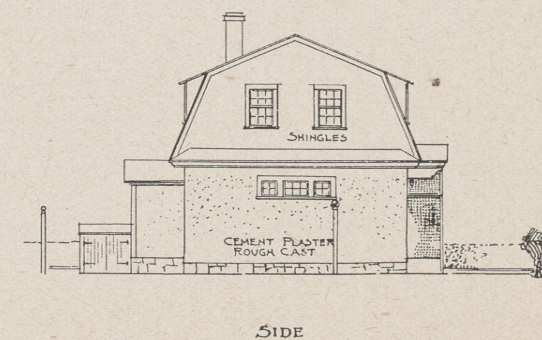
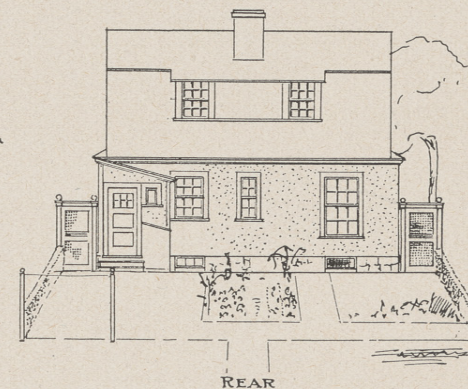
SUPPLEMENT TO
CANADIAN ARCHITECT AND BUILDER
NOVEMBER, 1906

THE AGED WOMEN'S HOME, TORONTO.
MESSRS. LANGLEY AND LANGLEY, ARCHITECTS, TORONTO.
PLANS.

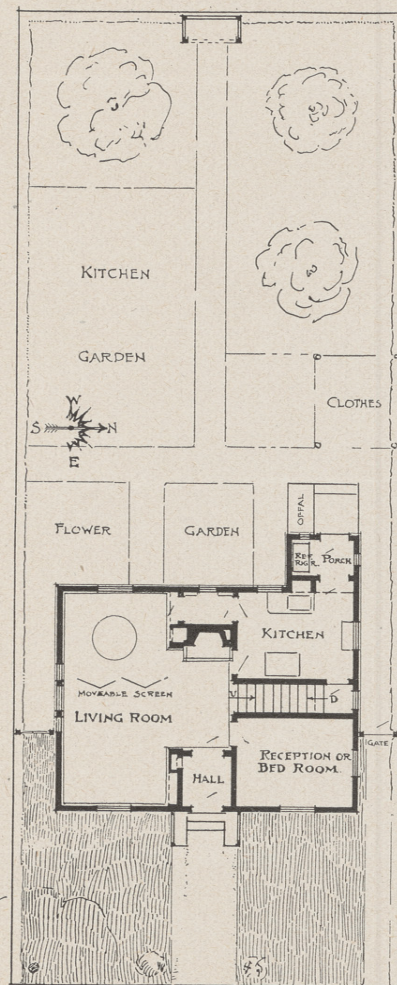


• CANADIAN ARCHITECT AND BUILDER COMPETITION •
 • DESIGN FOR A MECHANIC'S HOUSE •
 TO COST FIFTEEN HUNDRED DOLLARS & HAVE SIX ROOMS.

SUBMITTED BY 1500.



PLANS AND ELEVATIONS
 AT SCALE: $\frac{1}{8}$ INCH = 1 FOOT.



covered by leaded art glass shades. In keeping with the rest of the fixtures, are six walnut portables, illustrated in Fig. 11, with art glass shades, and equipped with three 8 c.p. lamps each.

Fig. 12 shows a wrought iron billiard table fixture, of which two are used in the billiard room. From the

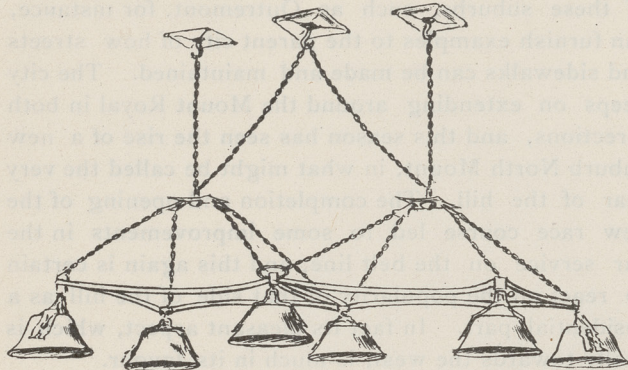


FIG. 12.

standpoint of illuminating engineering it is a disappointment to find two 16 c.p. lamps inside of each of the metal shades, which are painted white on the inside, and the lamps placed at a very ineffective angle. The resulting illumination is sufficient, but could have been much better accomplished by using only one 16

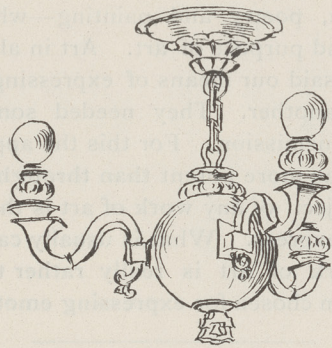


FIG. 13.

c.p. lamp in each shade, and fitting the same with the most efficient form of prismatic reflector, which would be completely concealed by the opaque metal shade.

Figs. 13 and 14 illustrate a ceiling light, and bracket used in first floor hall and billiard room. As a general thing it is difficult to produce either a pleas-

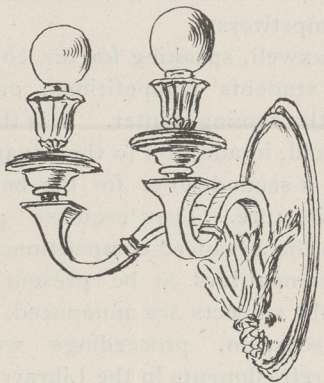


FIG. 14.

ing effect or good illumination by the use of ceiling fixtures having arms pointing up, so as to obscure the downward lighting. This also tends to produce very inartistic ceiling shadows.

It must be observed that the faults in illumination in this hotel are due in most cases to the pointing of

lights upward instead of downward. This has an unfortunate effect in the lighting of bedrooms where all brackets have been located with a view to furnishing illumination near dressing tables, etc., but as the lights are pointed upward, and fitted with frosted shades, the illumination is far from sufficient. It would also have been better in a hotel of this class, to provide some general lighting from a ceiling fixture in the bedrooms.

RESURFACING HARDWOOD FLOORS ECONOMICALLY.

Every house owner knows the cost of keeping hardwood floors in repair. Notwithstanding the best care the floors in time will become marked, the surface darkened by wear, and instead of being bright, clean and attractive the floor becomes an offense to the eye. Usually it is considered necessary to have the floors cleaned and put in shape every year or so, and occasionally to go to the expense and bother of having them scraped by hand, a tedious and costly process.

Few people would have been willing to admit that a machine could be devised that would "scrape" a floor, get into every corner and close up to the baseboards, and do the job as neatly and with one tenth of the expense that such work is done by hand. The "Little Giant" floor scraper, it is claimed, will do



THE "LITTLE GIANT" FLOOR SCRAPER.

this apparently impossible work. Sufficient tests have been given to enable the patentee and manufacturing company, the Hurley Machine Company, Limited, of Toronto, to go before the trade with this assertion, which it stands ready to substantiate on any occasion.

The retail lumberman should be interested in this invention. Frequently people of moderate means hesitate about putting in hardwood floors because of the expense of keeping them in repair. Probably the average builder does not relish paying out each year or every other year in cleaning a floor as much as it cost to put it in. Genius has come to his assistance and made it possible for him to indulge this taste for hardwood floors, with the assurance that when necessary they can be cleaned and put in shape at a very moderate cost.

Retail dealers are concerned with this invention because they can, by keeping the scrapers on hand, increase their sales of hardwood flooring and rent or loan the machine to carpenters or decorators to scrape the floor when that process becomes necessary. The price of the scraper is \$65.00 f.o.b. Toronto Canada, and this investment by a retail dealer in an ordinary community should be made good several times each year by the additional profits from selling hardwood flooring or whatever moderate rental he may charge those who use the machine which is sold by the Hurley Machine Company, Limited, 117 Home Life Building, Toronto. The accompanying illustration shows that it is possible to scrape up to the baseboards and that the machine does what is claimed—gives a new surface to the entire floor.

MONTREAL NOTES.

In more ways than one the season now closing has been one of the best. The weather has been exceptionally favorable to building operations and the building operations have been extensive. But everything comes inevitably to its end, and the best of businesses have their setbacks. Of the large number of buildings which have been pushed forward, in the view of being roofed in before the cold weather should arrive, a considerable proportion has failed to reach this hoped for point. The difficulty in most cases has been the structural steel work. The three firms in the city who handle this class of work have all been excessively busy and the result has been a general delay in building works. A special push is now being made with the new theatre which is being erected in St. Catherine street a little east of Phillips Square, where formerly stood a Baptist Church. Though not yet far advanced, the completion of this work is required by February 1st. Bennett's theatre, as it is called, is to accommodate an audience of about 1650 people; the division of these being fairly equal between orchestra stalls, balcony and gallery. Fifteen exits are provided. Space is reserved for a promenade foyer. The performances are to be of vaudeville class, and the opening of this theatre may be expected to cause the appearance of sundry restaurants in this part of St. Catherine street. The site, as already stated, was formerly occupied by the first Baptist Church. The next building eastward is the principal Methodist Church of Montreal; just opposite is a Presbyterian Church; and close by are two stores for the sale of religious literature; so the morals of the new arrival should be well looked after. The architect is Mr. Charles E. Horn, the builder Mr. E. E. Horn and Messrs. Lacroix and Piché the local architects.

A ten story building is proposed for Messrs Willis & Company, at the corner of St. Catherine and Drummond streets. The new Mount Royal Club house in Sherbrooke street is now completed, and has been in occupation since the 28th of October. The foundation stone of the Church of Messiah, at the corner of Sherbrooke street and Simpson street, was laid on the 22nd of October, and the work is going ahead quickly. Just opposite this the Linton Apartments, which will probably be the largest apartment house in Montreal, is now making a large appearance. The lower portion of the front is of what looks like large blocks of terra cotta with a gray speckled surface. In the present state of the works it is difficult to say what is the particular virtue of this material. The new Emmanuel Church in Drummond street is hastening to get under cover for the winter. The brick employed here is of a pleasant pale drab colour and is from a New York maker.

Discussions have been taking place recently as to the advisability of abolishing the St. Lawrence Market, and establishing a new Technical School upon the site; erecting a ten storey building, with school accommodation above and civic health department below. A high building can hardly be a convenient one for a school, and it would be much healthier for a health department not to shut out the sunlight from its neighbours. The large classes at all evening technical schools, however, show the demand for technical education, and to have a number of such schools in different parts of the city would soon bear fruit in the larger number of intelli-

gent and well trained men. All interested in the satisfactory execution of work, especially in all building trades, would appreciate this.

The value of the new building for which permits are issued falls off at this time of the year, but there is still considerable activity especially in the erection of residential property in the suburban districts. Some of these suburbs, such as Outremont, for instance, can furnish examples to the parent city of how streets and sidewalks can be made and maintained. The city keeps on extending around the Mount Royal in both directions, and this season has seen the rise of a new suburb North Mount, in what might be called the very rear of the hill. The completion and opening of the new race course led to some improvements in the car service on the belt line, and this again is certain to react on the popularity of that side of the hill as a residential part. In fact its pleasant aspect, which is really towards the west, is much in its favour.

The University Lecture of McGill College was this year delivered by Prof. P. E. Nobbs of the Architectural Department. The title given to the address was "Art in its Lowest Terms", and it was largely devoted to a critical comparison of the philosophic theories of aesthetics of Marshall, Tolstoi, Santayana, and Hirn. After indicating the widely different attitudes towards art of these writers, the professor devoted himself to elucidating—by illustrations from architecture, sculpture, poetry and painting—what was the real nature and purpose of art. Art in all its various forms was he said our means of expressing our emotions to one another. They needed some means or vehicle of transmission. For this the appeal though the senses was more potent than through the reason. The real subject of any work of art is the emotion it endeavors to express. What is usually called the subject of a work of art is really rather the occasion which has been chosen for expressing emotion.

SKETCHING CLUB P. Q. A. A.

On Wednesday, 24th October, the Club held the first of its series of weekly meetings for the winter session, at the Association rooms, No. 5 Beaver Hall Square. The business was the arrangement of the winter programme. The president, Mr. C. S. Burgess, called attention to the fact that during the last season prizes in books to the value of \$100 had been awarded to successful competitors.

Mr. W. S. Maxwell, speaking for the committee in charge of the students' competitions, outlined the programme for the coming winter. It is the intention this season to hold, in addition to the advanced series of competitions, a second series for the benefit of beginners in architecture. The "esquisse" principle is to be adopted in the advanced competitions, making it necessary for competitors to be present on those evenings when the subjects are announced.

After the discussion, proceedings were closed pleasantly with refreshments in the Library.

On the 31st October, the first announcements of competitions were made. A special offer having been made to the club of a competitive prize of the value of \$25.00, from the Canadian Handicrafts Guild, this competition was announced in lieu of that which had been previously intended for the advanced class. The competition is for the arrangement of a series of bays

to represent summer rooms, at the exhibition of the Guild, at the Art Galleries in Phillips Square, in February next. The rooms are to be arranged specially for the advantageous display of the Canadian Home Industries in which the Guild is interested. The drawings are to be submitted on November 28th. The subject of the Junior competition is an outlook in Greek Ionic style.

On the 7th November, the subject of the programme was a debate "Has L'Art Nouveau had a beneficial influence on Architecture"? Most of the members present had a word to say on the subject, which was dealt with in a lively manner. No vote however was taken, as it was understood that several members were speaking rather as special pleaders than as convinced.

SOME RECENT BUILDING PERMITS IN MONTREAL.

The church of the Messiah, Unitarian, in Sherbrooke street, at the corner of Simpson street; of brick and stone with roof of galvanized iron; to cost about \$60,000; contractor, John Quinlan & Company; architects, E. & W. S. Maxwell.

House for H. V. Meredith, in Peel street, near Pine avenue; to be built of pressed brick with gravel and slate roof; to cost \$45,000; contractors, Amos Cowen & Company; architects, E. & W. S. Maxwell.

House for Mrs. Lindsay, in Ontario avenue, near Sherbrooke street; of stone and brick; cost \$21,000; contractor, Jas. Morrison; architects, Taylor, Hogle & Davis.

House in Pine avenue, near Côte des Neiges road; for Jas. Walker; of pressed brick with cement and resin roof; cost \$18,000; contractor, John Allan; architects, D. R. Brown & Hugh Vallance.

Schoolhouse, corner of Boucher and Drolet streets; of stone and pressed brick; for the Catholic School Commissioners; contractor, D. de Ladurantaye et Fils.

Offices in McGill street for the Canadian Express Company; ten stories high, in stone and brick with composition roof; contractor, J. H. Hutchison; architects, Hutchison & Wood.

Four houses, forming twelve dwellings; in St. Urban street and Esplanade street, near Rachel street; for Chas. Dagenais; to be of stone and brick; approximate cost \$20,000; architect, J. A. Godin.

Factory in Nolan street for Canadian Pacific Railway Company; 672 ft. by 100; of one storey in brick with gravel roof; to cost \$70,000; contractors, D. G. Loomis & Sons.

Factory, No. 83 Amherst street; for Wm. Clerk; three stories in brick; 135 ft. 8 in. x 39 ft.; cost \$28,000; architect, W. E. Doran.

Factory in Côte St. Paul road, near Acorn avenue; 200 ft. x 50 ft.; 2 stories in brick with cement roof; for Jenkins Bros., Limited; to cost \$35,000; architects, D. R. Brown & Hugh Vallance.

Factory in Acorn Avenue; 124 ft. x 64 ft.; for Jenkins Bros., Limited; to cost \$30,000; architects, D. R. Brown & Hugh Vallance.

Factory for Messrs. Southam, Limited; in St. Alexander street, near Laganchetière street; 35 ft. x 248 ft.; of brick in two stories, with cement and resin roof; to cost \$35,000; architects, D. R. Brown & Hugh Vallance.

Station buildings for Canadian Pacific Railway Company; 176 ft. x 87 ft.; of two stories in concrete with

slate roof; cost about \$38,000; contractors, D. G. Loomis & Sons.

Warehouse for the Montreal Rolling Mills Company 68 ft. x 60 ft.; three stories in brick with gravel roof; to cost about \$25,000; contractor, Geo. W. T. Nicholson.

Extension to Mont St. Louis College, Sherbrooke street east; 100 ft. 6 in. front, 117 ft. 10 in. rear, 60 ft. 6 in. deep; five stories in stone and brick; to cost about \$60,000; proprietors, Les Frères des Ecoles Chrètiennes; contractor, Magloire Huberdeau.

SPONTANEOUS IGNITION OF WOODWORK.*

Next to matches as a cause of accidental fire comes the firing of woodwork by faults in flues or overheating in the vicinity of the fireplace. One would imagine that such a thing as building a beam into a chimney, or laying a joist close under the hearth of a fire-gate, would be so manifest a danger as to insure its never occurring, but such criminal carelessness is by no means so uncommon as one might imagine, and in such cases it is only a question of time and chance for a fire to be caused by it.

A beam, the end of which impinges on the interior of a flue, may be so far above the grate that for years no trouble arises, but the hot upcurrent of gases in the chimney will gradually dry and carbonize the wood, whilst any collection of soot in the chimney catching fire will start a smoldering combustion in the beam that may go on for a considerable time before it gets sufficient air to cause it to break into active combustion.

A more usual source of danger is to be found in the perishing of the mortar used in building the flue, this leaving gaps in the brickwork behind which the wood work is situated. Mortar practically consists of a mixture of slaked lime and sharp sand, and when brickwork has been laid with this, the first hardening of the mortar is dependent upon the slaked lime absorbing carbon dioxide from air, which converts it into carbonate and causes it to harden, while after the lapse of many years a further action takes place by the silica of the sand acting on the calcium carbonate to form a silicate of great hardness and strength. With modern buildings, however, the first action is the only one that has taken place.

The brickwork in the interior of a flue is often very roughly laid, being out of sight, and the bricks, instead of being laid true and nearly touching, are made up with broken bricks and a considerable quantity of mortar. After this has set the action of heat upon it is again to burn the calcium carbonate back to lime, so causing the crumbling down of the mortar, and should a joist have been built-in close to the casing of the flue, hot gases will find their way through the perished mortar to it, and gradually bring about slight carbonization of the wood, and occasionally cause its ignition.

Another fruitful source of danger is to be found in the replacement of one form of grate or fireplace with a new one. For instance, a grate is getting rather old, you determine to have it replaced by one of modern construction, say one of the "well fires." In the old grate the hearthstone was flush with the floor, and under this was a sufficient mass of concrete or mortar amply to protect the joints below from undue heat. You probably buy a new grate from a local ironmonger and intrust him with the job of fixing it, and the old hearthstone and insulating material having been removed to make way for the entirely different structure, the inexperienced workman fails properly to insulate the bottom of the well-grate, with the results that the joists below get overheated.

Dangers of these characters can only be got over by strict supervision during the building of a house, and by intrusting alterations and repairs only to workmen who thoroughly understand the work which has to be done.

All heating dangers are largely increased, and indeed

*Extract from a lecture by Vivian B. Lewis, Professor Royal Naval College, Greenwich, published in the "Journal" of the Society of Arts.

chiefly exist from the fact that lightly-charred wood becomes almost pyrophoric in its character, and can readily be set on fire at temperatures considerably below those needed to start the combustion of either un-charred wood or charcoal. The changes taking place in wood under the influence of long-continued heating are of a complex and interesting character.

Wood consists mainly of a definite chemical compound called cellulose, a body formed from carbon, hydrogen, and oxygen, and besides cellulose we find wood contains the constituents of the sap and a varying quantity of water. The amount of water present depends upon the season of the year and the portion of the tree from which it is taken, while the percentage is, as a rule, greater in soft than in hard woods, the following table giving an idea of the quantity present in various kinds of wood :

Beach.....	18.6	per cent.
Oak.....	34.7	"
Common Fir.....	32.7	"
Alder.....	41.6	"
Elm.....	44.5	"
Poplar.....	50.6	"

When wood is placed under cover and exposed to the air for about a year the moisture is reduced to about 20 per cent., and the remaining moisture can be got rid of by subjecting the wood to the action of heat, the last portions requiring a temperature sufficient to char the wood. If, however, the wood be heated somewhat below this point the greater part of the moisture is removed, but on again allowing the wood to cool to atmospheric temperatures and exposing it to the air, the hygroscopic nature of the wood gradually attracts moisture until the percentage reaches about 20, at which point a sort of equilibrium is established between the moisture in the air and the wood.

When wood is exposed to the long continued action of heat it undergoes progressive changes nearly akin to those which have taken place during the conversion of vegetation into coal. Up to 100°C. (212°F.) practically only moisture is expelled from the wood, and at a few degrees above this point not only water but volatile hydrocarbons are slowly driven out, while at 150°C. (320°F.) oxides of carbon, together with more hydrocarbons, are disengaged, and slightly above this temperature the wood commences to assume a scorched appearance, and to turn brown. At about 250°C (482°F.) wood is converted into a soft brownish form of charcoal, which is its most dangerous form, being highly pyrophoric and self-igniting at comparatively low temperatures. At 300°C. (572°F.) the carbon begins to assume the appearance of soft black charcoal, getting harder and more metallic in its properties as the temperature increases.

The chemical changes which are taking place in the charcoal at these varying temperatures are strictly shown by the following table.

Temperature.	Carbon.	Hydrogen.	Oxygen.	Ash.
270°C.	71.0	4.60	23.00	1.40
363°C.	80.1	37.1	14.55	1.64
476°C.	85.8	3.13	9.47	1.60
519°C.	86.2	3.11	9.11	1.53

It is seen that as soon as 270°C. is reached the action consists in a gradual increase in the percentage of carbon, owing to the elimination of hydrogen and oxygen, and it is clearly due, therefore, to compounds still containing these three elements in comparatively large proportions that the pyrophoric carbon owes its dangerous character. If the contact of the wood with the heated surface be continued for a sufficiently long period of time, a temperature of a few degrees only above the boiling-point of water is enough to produce a semi-carbonized film on the wood; which will start smouldering at a very low temperature, the heat rising from an oil lamp or gas flame some distance away being sufficient to start the smouldering combustion. Indeed, the temperature of a steam-pipe has been found sufficient to cause ignition, this being due probably to the long-continued heat generating certain hydrocarbons of low ignition point, which remain

occluded in the pores of the semi-charred wood, and are there brought into close contact with the occluded oxygen.

It must be remembered that, when using steam heating, although the boiling-point of water at ordinary atmospheric pressure is only 100°C. (212°F.) yet the boiling point rapidly increases with increase of pressure, as is showing by the following table :

Pressure in atmospheres.	Boiling-point, °C.	Pressure in atmospheres.	Boiling-point, °C.
1	100	12	190.0
1.5	112.2	14	197.2
2	121.4	16	203.6
3	135.1	18	209.4
4	145.4	20	214.7
5	153.1	25	226.3
6	160.2	30	236.2
7	166.5	35	244.8
8	171.1	40	252.5
10	181.6	45	265.9

So that in lofty buildings heated either by water or steam it is quite possible to obtain temperatures which will dangerously char wood in contact with the pipes, while with air as the heating medium it is by no means uncommon to find a dull red heat in the pipes and flues near the furnace. Nor does the danger cease when care is taken that the pipes or flues used for these methods of heating are kept several inches away from any woodwork, as in inaccessible places the accumulation of dust on the pipes often gives rise to trouble.

When a hot-water or steam pipe is laid alongside a wall, it will be noticed that where a flange or other projection of a pipe touches the wall there is a brown stain produced on the wall surface streaming upwards from the point of contact and becoming less the farther away it gets from the place where it starts. Experiment shows that this is due to dust settled on the pipe becoming carbonized and ascending with the hot-air current produced by the pipe; this current comes in contact with the surface of the wall and, the hot gases rapidly diffusing through, the charred particles are filtered off, remain on the surface of the wall, and give the stain. When, however, the accumulation of dust is large, the carbonized mass being in a very loose state of aggregation and made up of very minute particles, will often start glowing with a very slight increase of temperature above the ordinary temperature of the pipe.

The fire-risks due to lighting are of a most varied character, even daylight itself not being free from danger, hundreds of fires having been caused by the accidental focusing of the sun's rays by means of a full water-bottle, irregularities in the window pane or other cause, which has led to the concentration of the sun's rays upon some inflammable substance.

THE DISAPPEARANCE OF LUMBER.

At its recent session in Memphis, Tenn., the National Hardwood Lumber Association heard a committee report that must have been of interest to its members. The committee advised that according to the best available estimates there are now standing in the United States about 1,475,000,000,000 feet of timber, which is being depleted at the rate of 45,000,000,000 feet every year. On this basis, forests now existent would become exhausted in 33 years; but the cutting of timber is not the only agency at work to reduce the available supply. Forest fires, wood for pulp, paper, telegraph poles, cross-ties, piling and fuel, added to the regular cut result in the consumption of about 75,000,000,000 feet every year. A conservative estimate by the lumber experts states that there is not enough timber standing to continue commercially for more than twenty years. Long before the first quarter of the present century is reached, the chief use of lumber will be as an adjunct to concrete in building construction.—Concrete.

MANITOBA ASSOCIATION OF ARCHITECTS.

The regular monthly meeting of the Manitoba Association of Architects was held on Friday, Oct. 19th, at which Mr. C. A. P. Turner read to the members an excellent paper on "Reinforced Concrete Construction." Mr. Turner gave illustrations by lantern slides of various methods now used, showing the development of the work from the earliest to the latest system the last of which dispenses with beams of all descriptions, his name for this construction being the "Mushroom System."

It is the intention of the Association to hold similar lectures at each of the monthly meetings, and if each one is as interesting as the last the success of the meetings for the future is assured.

THE USE OF SPRUCE, BALSAM AND POPLAR.

THE CANADA LUMBERMAN was asked to obtain the opinions of the lumber trade on the following questions:

- (1) Does balsam make a good shingle?
- (2) Does spruce, poplar or balsam make good lath?
- (3) Does balsam make good weather boarding?

In submitting the questions the subscriber says: "On account of the growing scarcity of pine and the tendency to bring other woods into use, no doubt others besides ourselves will be pleased to have the opinions. There seems to be, in some parts of the country, a prejudice against these woods for the above purposes, whereas in other parts they are accepted as first class material."

The answers received are given below, the numbers

corresponding to the numbers prefixed to the questions.

- (1) I think that balsam would make a very poor shingle.
- (2) Balsam and spruce make very good lath, but of course not as good as pine. Poplar I do not know anything about.
- (3) Balsam would make fairly good weather-boarding but not nearly as good as white pine, as it is very apt to rot in any place where there is dampness and would not stay to its place as well as pine. I think the sun would curl it where there would be any chance. Balsam and spruce rot a great deal quicker than white pine.

(2) The only question we can speak on with authority is No. 2. We believe that balsam is equally as good a lath as pine. It won't stain plaster, won't twist and nails well. We have had a few balsam lath in our office for nearly a year and they are still white and as straight as an arrow. While spruce makes a good lath, we do not like them as well as balsam.

(1) I do not think balsam shingles would be much use for the reason that the black knots in balsam will drop out when the timber gets dry.

(2) Both spruce and balsam make good lath, especially balsam owing to the texture of the wood being softer than spruce; as to poplar, would say I have not seen any of these lath but think this class of wood would be very suitable, as it is taking the place of pine in some cases for door and sash work, and is considered to be almost as good.

(3) Would think that balsam would not be very good lumber for weather boards for the same reason as applies to shingles.

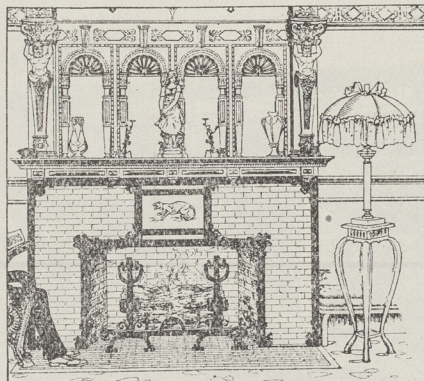
(2) We think that spruce would make good lath, and we understand that in the Eastern States they would just as soon have them as white pine.

(1) We have never seen shingles made out of balsam and don't think this wood would make good shingles, for being very much of the same nature as spruce and a good deal harder than pine or cedar, it would warp.

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(2) Spruce, poplar and balsam are all right for lath, but of course not so good as pine. Still we think that if the trade were not so prejudiced in favor of pine these woods could be used in lath satisfactorily to a great deal larger extent than they are.

(3) Balsam we think would not make good weather boarding for the same reason that we think it would not make good shingles, it would be too apt to warp.

(1) We think balsam would be useless for making shingles, for the reason that its lasting qualities are exceptionally poor where there is any dampness.

(2) I presume any of the three woods mentioned would make satisfactory lath, as they would always be dry.

(3) I would not want to use balsam for any work where it was exposed to the weather, but for flooring or other purposes where it was not exposed, I think it would be quite satisfactory.

(1) Would say not, owing to its warping in the sun so readily and it would decay very early.

(2) Spruce or balsam would no doubt make very fair lath. It would certainly be apt to split readily with the nails and probably cost more for putting on.

(3) No. For the same reason that it would warp as in shingles, and it is very short lived, that is, it would possibly decay inside of four or five years.

(1) We have never seen or handled any balsam shingles; if they have been used at all it has probably been in back country villages and the product of small mills. Their value can only be determined by the test of experience.

(2) Spruce makes a very good lath. We do not know anything of poplar or balsam, and do not think these woods have ever been manufactured into lath. The spruce lath now on the market comes almost entirely from Quebec, as Ontario spruce does not grow large enough to make any quantity of lath.

(3) We have never seen balsam used for weather boarding.

It is very frequently, perhaps unusually, mixed with spruce when sold in the wholesale market. The percentage of balsam handled in this way is small. Whether or not balsam will make good weather boarding can only be determined by the test of experience. We do not feel competent to express an opinion on this merely from a knowledge of the wood. Like balsam shingles, it might be possible to find evidence in regard to these woods in backwoods villages near small mills.

(1) Emphatically No.

(2) Spruce, good; balsam, fair; and poplar, doubtful.

(3) Balsam is a soft spongy wood, with very little life in it at any time, and on that account it is very easily destroyed by exposure to the weather, and I would not hesitate to condemn it as a weather board, but if balsam were used as matching for inside work, such as summer cottages, and a good quality of lumber is used for such purposes, I would not hesitate to recommend it as a good cheap material.

(1) It has no lasting qualities when exposed to the weather.

(2) Only fair.

(3) No, for the same reason as outlined in 1. It would, however, have a tendency to last longer if well painted.

(1) I would not think that balsam timber would answer for shingles at all, as this timber rots very fast and would only last for a few years.

(2) I do not see any reason why spruce, poplar and balsam would not make good lath, and they should make lath superior to hemlock lath, being stronger and not so liable to break.

(3) I would not think that balsam would make good weather boarding, as it is so liable to decay quickly, and I understand that it does not hold the paint well.

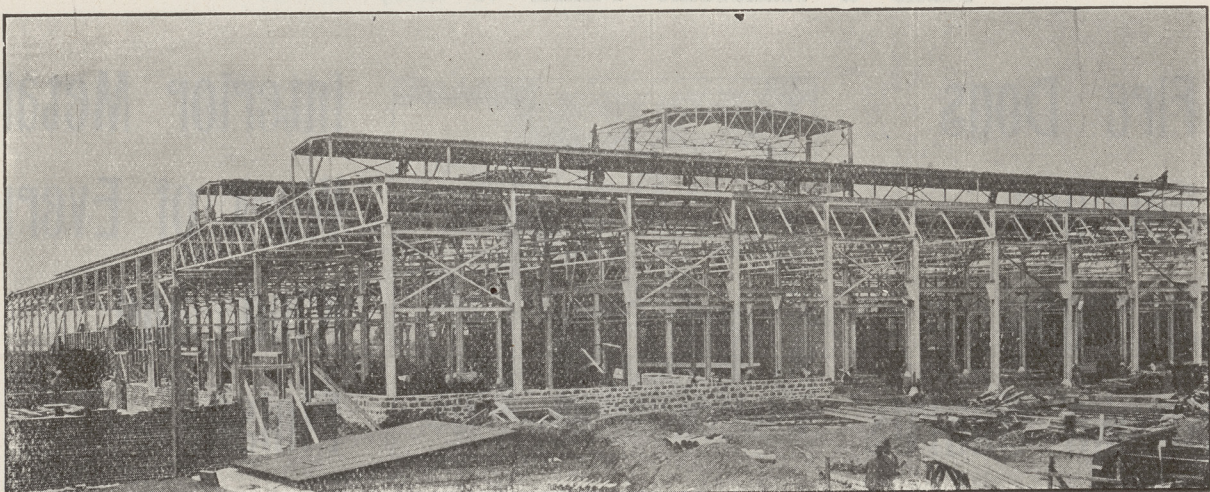
(1) I do not consider that balsam makes a good shingle.

(2) Spruce, poplar or balsam makes a fairly good lath.

(3) Balsam does not make a good weather board, it wears

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quicker than spruce or pine as it is much softer and not so strong, but I presume under paint would be better.

(1) I might say that I have never handled any balsam shingles and do not think that they would give satisfaction, as balsam is a wood that, when exposed to the weather as a shingle is, is bound to warp and crack.

(2) Yes. Lath have been manufactured from these woods for some time and they give good satisfaction. While not equal to white pine, they are a very good substitute when pine is scarce.

(3) I know of a house in Leamington that was sided with spruce and balsam thirteen years ago and painted at that time. This house was examined a few weeks ago and found to be still in good shape. The siding had not rotted whatever and all it needed was some more paint to make it look as good as ever.

(1) Assuming that balsam to which you refer is identical with with our fir, we reply, yes.

(2) Spruce and balsam make good lath; we have never known poplar to be cut into lath, but, as it is a tough, strong wood when dry, we assume it would make good lath.

(3) Assuming, as above, that balsam is identical with our fir, yes. The fiber of fir or balsam is not as strong as spruce, but is yet of fair strength and when dry is a good wearing wood. As to the wearing qualities of balsam as a shingle, we do not imagine they are equal in quality to spruce or pine, as it is a lighter wood and we assume would wear out by exposure more quickly.

(1) Balsam does not make a good shingle, it has not the lasting qualities.

(2) Spruce and poplar make a fairly good lath. Balsam not so good.

(3) Balsam makes very good weather boarding.

(1) Balsam does not in my opinion make a good shingle. The wood is shaky and does not stand the weather.

(2) Spruce, balsam and poplar make a fairly good lath. How-

ever, I would prefer the spruce to the balsam and poplar, and would not care to use either of the latter in a house were I owner of it.

(3) No shaky lumber stands well to the weather, and for that reason balsam does not make a good weather board. It also warps very easily, which would make it unfit for that use.

(1) We have not had experience with balsam, either as a shingle or as weather boarding. It does not appeal to us as being a satisfactory wood for either purpose.

(2) In regard to spruce lath, we may say that the Boston and New York architects specify that spruce lath must be used in preference to other lath. They are in general use throughout the United States. We have never used poplar or balsam lath.

(1) We have never known balsam shingles to be used and cannot say how they will last, but our opinion is that they will rot quickly.

(2) Balsam makes very good lath and good weather boarding if it is kept painted. In some sections the spruce is harder than others. Soft spruce makes good lath but the hard spruce is not so good. We have not had any experience with poplar lath, but we believe good poplar will make good lath.

Mr. Carnegie told a story of a Presbyterian minister who had been bold enough to introduce the hated innovation of stained glass. He was showing it in triumph to one of his parishioners, and asked her how she liked it.

"Ay, it is handsome," said she, sadly, "but I prefer the gless jist as God made it."

"We hear some strange things in this office sometimes," said the superintendent of sewers.

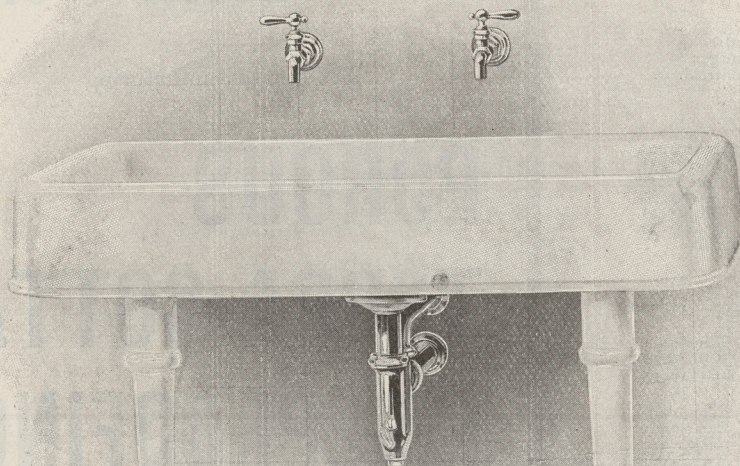
"One of our inspectors went one day to inspect an old house in the country. There was a good deal of smell about the old place. The inspector walked about sniffing.

"Dear me," he said, "what an unpleasant odor. Can it be the drains?"

The owner of the house shook his head positively.

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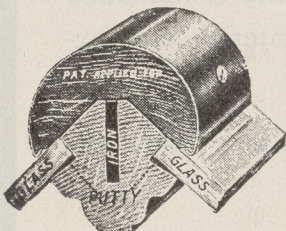
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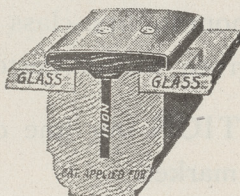
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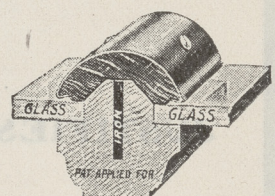
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BUILDING ON PERCENTAGE BASIS.

The scheme of conducting building operations on a percentage basis continues to invite discussion in the trade, and supplementing what has already appeared on the subject in these columns, an architect whose practice is large volunteers the statement that for the past ten years all contracts awarded by him have been on a percentage basis, figured on the actual cost of all material and labor that entered into the work. The results of his experience have convinced him that his method is much more satisfactory than to let contracts for a given sum. He finds that while the owner has no contract in advance for the completion of the building at a fixed price, the expenditure is always within his control, and verification is possible whenever desired, says The Inland Architect. Itemized bills for material and labor are rendered from time to time, and he has the satisfaction of knowing the amount and kind of supplies that are being used in his building. The always annoying item of extras is eliminated, and changes required during the progress of the work are made with the least possible expense. The owner feels throughout that his interests and his alone are paramount. There is no temptation on the part of the contractor to use cheaper materials than are specified, nor to slight the work, as he is assured of a fair profit.

The contractor by the percentage plan is not liable for unexpected advances in prices, nor for penalties for delay. There are avoided all the uncertainties and risks that are ever present with a lump sum contract, and the contractor is free in mind to push the work at every point in furtherance of the quick completion of the building and the best interest of the owner. The contractor would not likely attempt to manipulate vouchers to show fictitious cost prices as, if he were so disposed, the knowledge of the architect would be a

certain check upon such practices. The architect mentioned encountered opposition at first from the owner, who has the natural desire to know his full obligation at the start, but this has been overcome in every case when the owner has had brought to his attention the probable saving in cost and the many substantial advantages to him from the percentage basis. The contractor by such an arrangement becomes, in a degree, the agent of the owner, and harmony between all parties to the construction is fostered. The usual position of the architect as a buffer between the owner and the contractor ceases.

Notice is given that letters patent have been issued incorporating Messrs. Herbert W. Hollis, C. S. Tupper, J. A. Stevenson, F. L. Edwards, and Charles A. Allen, of Winnipeg, under the name of "Western Fire Clay Products, Limited," for the purpose of carrying on the business of manufacturers and dealers in brick, tile, pipes, and all articles usually manufactured from clay. The authorized capital stock is \$600,000. Winnipeg will be the headquarters of the company.

Articles of incorporation have been granted the Commercial Cement Company, Limited, with exclusive offices in Winnipeg and mills and laboratories, etc., on the Boyne river, in Roseisle township, about seventy miles southwest of Winnipeg. This company is incorporated with a capital stock of \$150,000. The promoters are Messrs. Otto Babcock, Sidney Clark, W. B. Wood, J. C. Bell and A. S. Dinnie, of Grand Forks, N. D.; Geo. E. Towle, Karl Farup, and C. D. Lord, of Park River, N. D.; and W. P. Alsip, of Winnipeg. An exceptionally superior quality of rock has been found in sufficiently large quantities to guarantee the output of a good sized factory for many years, and 640 acres of land, which includes the entire area of this valuable deposit, has recently been purchased by this company. The latest improved machinery has been ordered for a mill of over 1,000 barrels daily capacity. The product will be on the market for the early spring trade of 1907, and will be known as the "Three C Brand." Temporary offices of the Commercial Cement Company will be at 220 McDermot avenue, Winnipeg.

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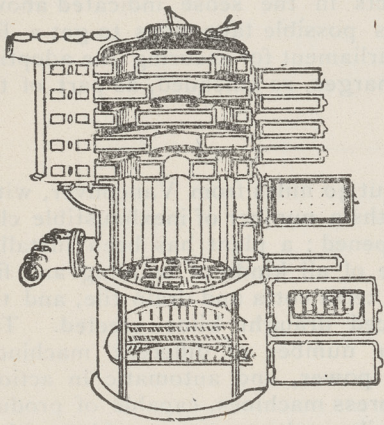
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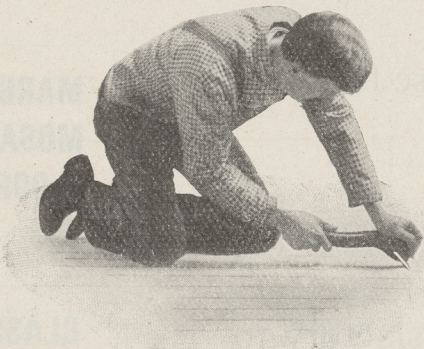
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THE OWNERSHIP OF ARCHITECTS' DRAWINGS.

MR. H. H. STATHAM'S MOTION IN THE INTERNATIONAL CONGRESS OF ARCHITECTS.

The question is distinct from that of architectural copyright in designs, with which it must not be confounded. It turns on the question whether the drawings and specifications made by the architect in order to carry out a building are to be retained in his custody or to be handed over to his client. In France and Germany no legal question is raised on the subject—the architect retains the drawings as a matter of law. In England the custom has been almost universal in the same sense. But in the case of *Ebby v. M'Gowan* (1870), the Court ruled that, the building not having been carried out, the drawings must be handed over to the client on his paying for the time expended on them. In the case of *Gibbon v. Pease* (1904), the Court, to the surprise of architects, ruled that the precedent of *Ebby v. M'Gowan* covered all cases, whether the building had been carried out or not, and that the client had a right to demand all the drawings, the Court refusing to hear any evidence on the side of the architect, whose drawings and specifications can, therefore, in England, be legally claimed by the client, although he already has what he really paid for—viz.: the building itself. It is pointed out that an architect is not paid for making drawings, but for producing a building, the drawings, being only his necessary instructions to the workmen; under some circumstances he might even dispense with drawings altogether. To require him to hand over to the client drawings and specifications, which represent the result of this professional experience over many years, for the client to use as he pleases, is a manifest injustice to the architect. Moreover, the custom in the profession of handing over the drawings to the client when the building has been planned, but not carried out, is a mistake on the part of the profession; as in such a case an unscrupulous client has only to say that he has

changed his mind in order to get possession of the drawings and use them as he pleases, with no further compensation to the architect. The wording of Clause I of the Institute Scale of Charges is most unfortunate, as it appears to state (though not so intended) that the architect's commission is for producing drawings of a building. The wording of this clause should be amended. The author moves the following resolution:

"That, in the opinion of this meeting, the Royal Institute of British Architects, having revised the wording of its paper on the Professional Practice as to the Charge of Architects in the sense indicated above, should as early as possible take steps to get a Bill introduced into Parliament for securing the adoption of their scale of charges, so amended, as part of the law of the land."

At Clayburn, about 40 miles from Vancouver, within the last few months a number of inexhaustible clay mines have been opened; a plant has been installed for the manufacture of all kinds of building and fire brick, fire proofing, terra cotta and drain tile, and the latest style of forced draught kilns erected. The factory contains a number of different machines, operated by steam power, and automatic in action. There are two dry-press machines, capable of producing 20,000 bricks daily, and an augur machine with a capacity of 35,000 daily. All the wares from this machine pass through drying tunnels before reaching the kilns. There are eight of these, each 105 feet in length. Permanent down-draft kilns are now in process of construction. These will be of different capacity, four of 75,000 each; one of 15,000, and three of 300,000 each. Plans have been prepared and construction will soon begin on the factory for the manufacture of sewer pipe. This building will be of brick, four stories in height, and will have a plant by means of which all the standard diameters of pipe may be produced.

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NOTES.

The capital of the Vancouver Fire Clay Company, Limited, which company control and operate the works, is \$230,000.

A charter of incorporation has been granted to the Barron Brick Company, Limited, with Toronto as its chief place of business, and a capital of \$90,000. The directors of the Company include Messrs. W. W. Vickers, R. Lawyer, and A. Ritchie, all of Toronto.

The Theodor Telier Construction Company, Limited, with headquarters at Toronto have recently been

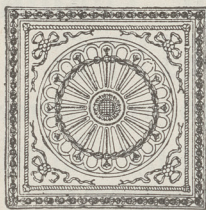
granted a charter of incorporation. The capital stock of the Company is \$250,000 and its directors, Messrs. Thomas H. Barton, F. D. Byers, and O. F. Taylor.

Letters Patent have been issued incorporating the Reliance Moulding Company, Limited, with a capital of \$40,000 to manufacture and deal in mouldings, cabinet wood-work, and other products of wood, metal trimmings, etc. The directors of the Company are Messrs. F. R. Phillips, G. P. Challenger, and D. McDonald. Toronto is to be the chief place of business.

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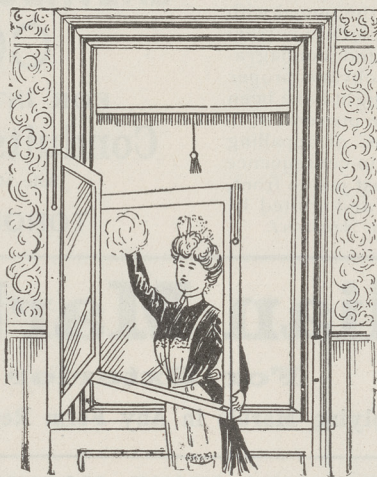
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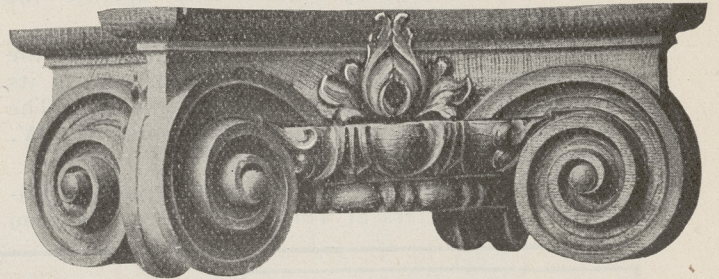
During the past season the Mira Brick Company have made some extensive improvements to their plant, and next season they expect to be able to supply all the brick required in Cape Breton. A new semi-continuous kiln has been installed. Two brickmaking machines are on the ground which will give a joint output of 35,000 bricks a day. There are now twenty-six drying sheds, and it is proposed to add an artificial drying plant next year. A twenty-four horse power engine and a forty horse power boiler have also been installed. The site of the plant is on a peninsula jutting out into the Mira River, about two miles above Mira Gut. The peninsula has an unlimited deposit of an excellent blue clay which covers an area of several acres. The clay cannot be surpassed anywhere for brickmaking purposes. Bricks made from it by the French during their occupation of Louisbourg are still in a good state of preservation.

It will be interesting to learn what unfavorable hygienic conditions are going to be developed by the operation of the great freight subway-system in Chicago that was opened to traffic July 1. The trouble arising from generated heat will not be as great as in New York subways, since there are not present the many lamps in the brilliantly lighted passenger-cars and the animal heat arising from the bodies of millions of passengers to contend with. But, on the other hand, the inevitable dirt and litter at each of the independent shipping-stations, whether public or private, are likely, in spite of careful policing, to get into main tunnels and there be driven back and forth by passing trains until reduced to dust and in that form sucked upward into stores and buildings, thus disseminating broadcast germs of filth diseases that may have been engendered in the tunnel by the careless personal habits of employees, working out of sight of supervision and indifferent to the obligations of common decency. If the matter of fire-doors and hydrants at each private opening into the tunnel has not received the anxious attention of underwriters, architects and building-owners, an accident in the tunnel with its inevitable fire caused by short-circuiting of electric current might easily lead to a serious and widely distributed conflagration in buildings on the surface. Doubtless, the obvious proper regulations for the exclusion of dangerous freight have been adopted by the operating company, but what is to prevent, with the desirable absolute certainty, a "dustexplosion" of appalling magnitude, in case a carload of innocent flour, in consequence of a collision, fills the tube with impalpable dust just in front, say, of the entrance to a large department-store, and ignited by the first flash of the short circuit?—*The American Architect.*

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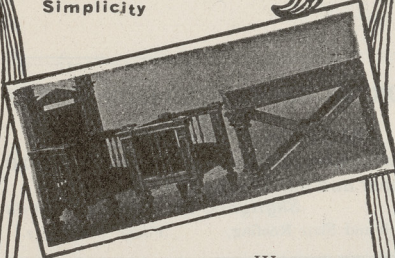
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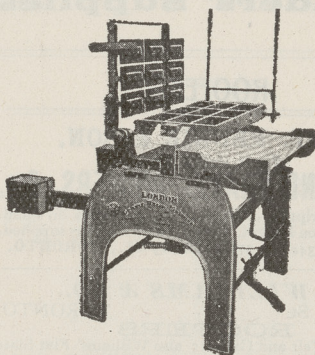
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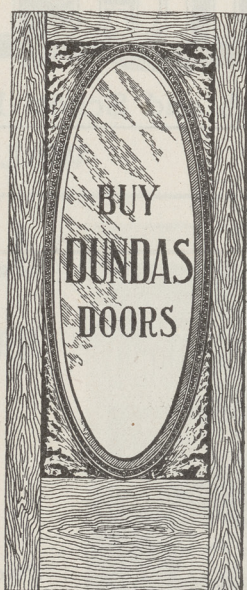
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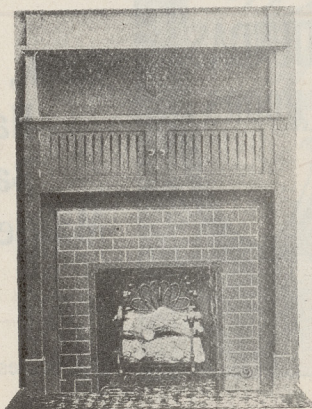
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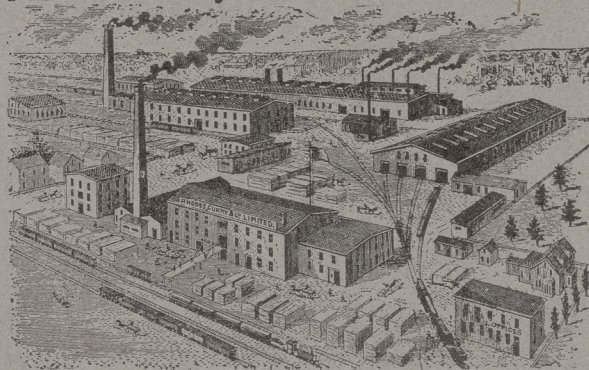
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